SOUTHERN
TEXTILE BULLETIN

VOLUME 26 CHARLOTTE, N. C., THURSDAY, MARCH 13, 1924 NUMBER 2

A BAHNSON Installation

The Usual Report on BAHNSON Humidifiers

"The humidifiers you put in for us the first of last year are giving perfect satisfaction and we are very much pleased with them.

"We have not spent anything on these humidifiers at all for upkeep and wish to say again that they are perfectly satisfactory."

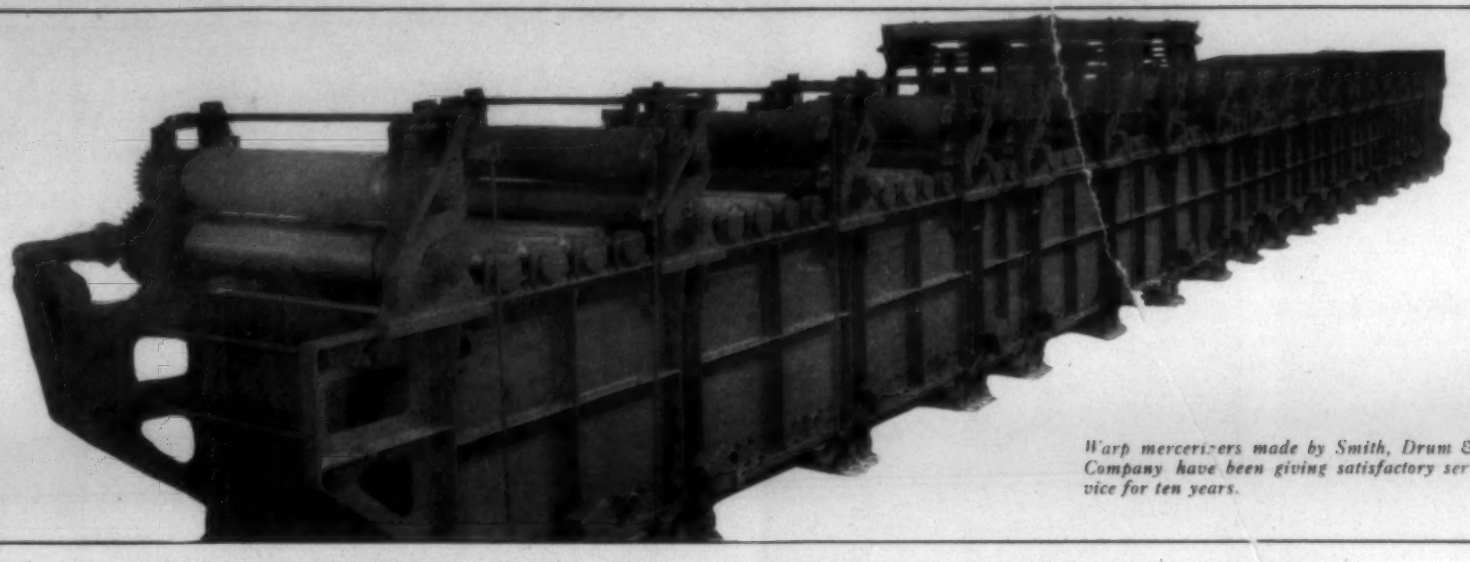
And BAHNSON humidifiers **keep on** "giving perfect satisfaction."

Complete information about the BAHNSON humidifier will be gladly sent on request.

The Bahnson Company

Humidification Engineers

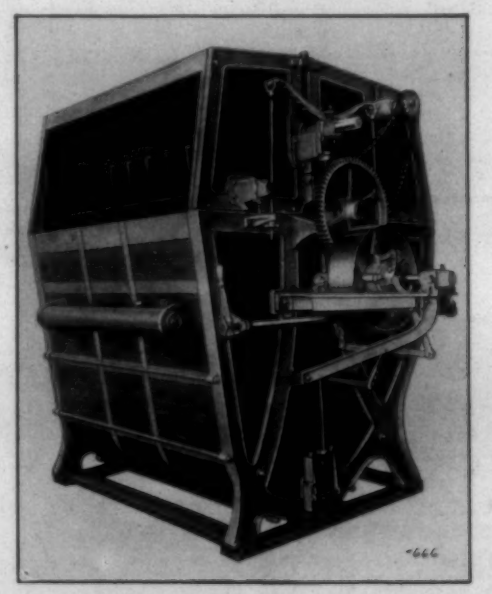
Winston-Salem, N. C. **New York Office: 437 Fifth Ave.**



Warp mercerizers made by Smith, Drum & Company have been giving satisfactory service for ten years.

Finishing Machinery Manufacturers and Users Prove the Value of Hyatt Roller Bearings

To insure economical and dependable operation of finishing machinery, many of the largest manufacturers equip their washers, fulling mills, mercerizers and other finishing machinery with Hyatt roller bearings.



The James Hunter Machine Company recommends and furnishes Hyatt bearing equipped fulling mills, washers and other finishing machinery.

The mills find that these power saving economical bearings give years of service without adjustment or replacement.

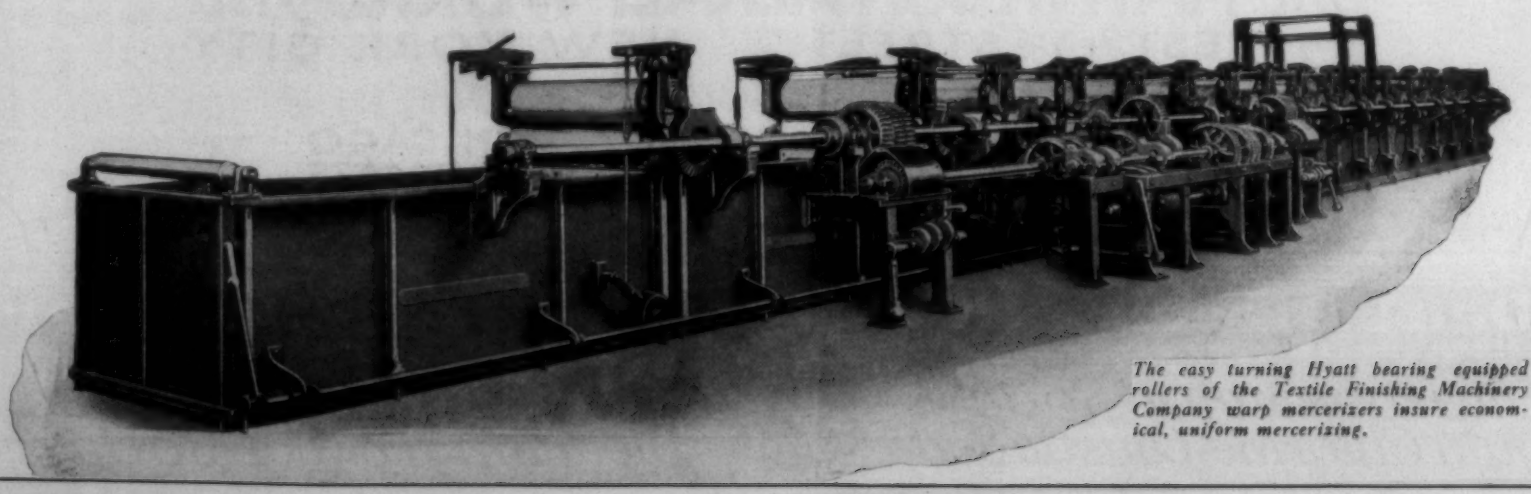
The oil-tight construction of Hyatt bearings makes them particularly advantageous for use in finishing machinery.

Write us for complete information on the advantages of Hyatt bearings for finishing machinery of all types.

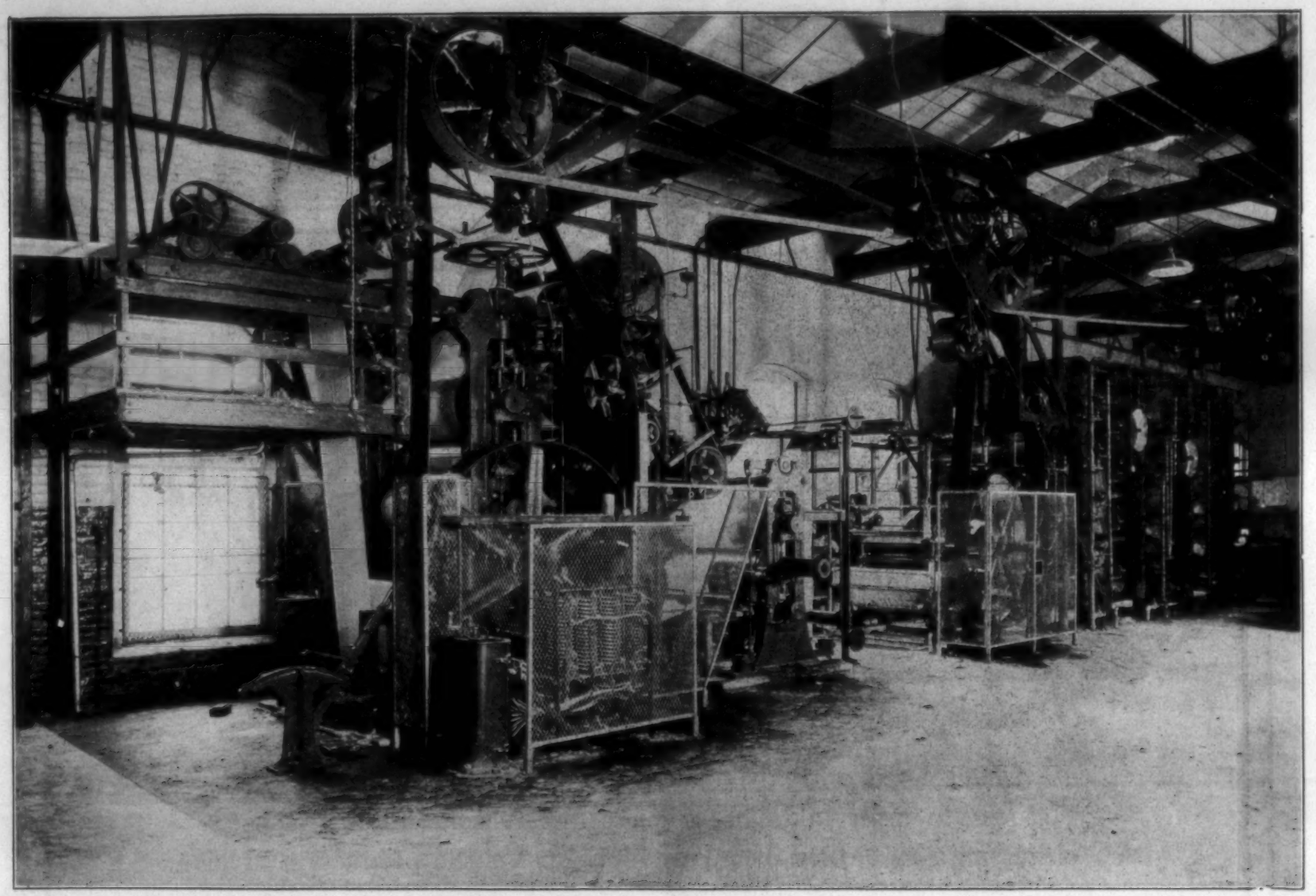
Hyatt Roller Bearing Company

Newark Detroit Chicago San Francisco
Worcester Milwaukee Huntington Minneapolis
Philadelphia Cleveland Pittsburgh
Buffalo Indianapolis

Showing the oil-tight construction of the Hyatt bearing housing on a Rodney Hunt washer. The top bearing has part of the housing and journal removed.



The easy turning Hyatt bearing equipped rollers of the Textile Finishing Machinery Company warp mercerizers insure economical, uniform mercerizing.



SOUTHERN TEXTILE BULLETIN

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*Industry is Giving Us a New South**

By Ashmun Brown

"MANUFACTURERS' Avenue" they call the main highway through the Piedmont section of North and South Carolina and Georgia, that wooded upland stretch of country reaching from the southern line of Virginia through the western tiers of counties on to Atlanta. This highway extends 177 miles in North Carolina alone; and in that distance the front doors of 128 cotton mills open upon it, an average of one cotton mill for each 1.38 miles.

But the story is not one to be told by figures alone. It is a vitally human story. At the bottom lies a change in the southerner's attitude toward life.

These Southern States contain no newly discovered material resources that prompt a rush for development. It isn't the upbuilding of new and extended systems of transportation that has made possible the increased production of goods for the country's and the world's markets. The explanation lies in the fact that the South has ceased to dwell in the past.

There was a day, not so long ago, when the descendants of the men who fought the lost cause, the best blood of the South, were content to subsist largely on tradition. It was not in keeping with that tradition for the scions of families that once constituted the aristocracy of the South to engage in any activity outside of the learned professions. Today, however, the best blood of the Carolinas and Georgia—and of other States of the old Confederacy, to a lesser extent—have cast off the ancient conventions, and with a virility and an ability equal to that displayed by their Revolutionary ancestors, have plunged into industrialism.

An inquisitive Westerner, familiar with the boosting methods and the constructive community spirit that has built the cities and States of the Pacific Coast, wandering through the Piedmont not long ago, was amazed at what he observed. In all his Western experience he never saw a finer spirit of progress than exists in Charlotte, Spartanburg, Greensboro, Gastonia, Winston-Salem and other ancient towns that have awakened overnight into modern, energetic centers of activity.

And in another aspect, the social change is still more marked. Once, in the long and somnolent period that followed the Civil War, the South, a region then of clearly defined social distinctions, contained practically no middle class. Politically and otherwise the aristocracy ruled. At the other end of the scale was the great negro population. In between but negligible as either a social or an economic factor was the "poor white" class—tenant farmers always in debt to the planter; mountain dwellers, remote, aloof and primitive, "our contemporary ancestors," as Walter Hines Page once called them.

New Living Conditions Prevail.

Today the poor whites as a class have almost disappeared. The factory has lured them from the tenant farm and from the mountain. The mill village, with its schools, its churches, its community life, its moving picture show, its visiting nurses, its resident physicians, has taught the primitive folk what the world has learned of the art of living.

Read the result in the health statistics of these Southern States. Disease is being controlled, life is being prolonged, infant mortality is decreasing, sanitation and personal hygiene are becoming common and not exceptional. The public health authorities have a ready explanation. The mill village, paternalistically dominated, if you will, has led the way. Industry, in short, has brought enlightenment and civilization to a great body of Americans.

The cracker and hill-billy are becoming extinct. The factory and the mill have made them over into modern Americans, standardized them on a 1923 model, maybe, but with a broader, more comfortable and richer life than they or their ancestors ever knew. Industry has opened to them and their children the door of opportunity, a door which they themselves once held shut.

Respected and self-respecting, they play their part in this new era of development. The mill and the factory have given them an economic independence which they have found better than the independence of shiftlessness that satisfied their forefathers. They and their children and their children's children have broadened out into other activities, advanced in many instances to places of responsibility and have furnished what, for a better name, may be termed a middle class, which is so necessary to the balanced organization of a successful community.

Perhaps it would be better to say that the progress these people have made through the closer human contacts made possible by industrialism and through the the educational advantages offered them has eliminated the old class divisions and caste lines. There are sons of hill dwellers, one generation removed from the mountain shanty, who are presidents and managers of mill corporations, living in modern homes, with their children in universities.

It is a widely accepted belief that this change is due primarily to the investment of Northern capital in Southern industry. A careful examination discloses the fallacy of this theory. It is true that Northern capital is flowing Southward now in an ever-increasing stream. It is gossip in the cotton textile trade that forty-eight million dollars of Northern money went into Southern mills in 1923. Nevertheless, the preponderance of capital represented in Southern industries is still Southern, and the conditions that now draw Northern capital were made by Southerners.

It is in the complete conversion of these Southern States to industrialism, that the real reason is found. Towns, counties and States have thrown themselves into the movement for increasing industrial productivity. The motorman on the street car, the policeman on his beat, the small shopkeeper—all are boosters for Southern factory development. The South holds out a warm and earnest welcome to all who would establish a new manufacturing plant.

Robert Amory, of Boston, president of the National Association of Cotton Manufacturers, made up of Northern cotton mill men, in addressing the American Cotton Manufacturers' Association, composed of Southerners, at a convention at Richmond last May, expressed this thought.

"I cannot," said he, "emphasize enough that your greater advantage is the good will of the citizens of your respective States and their sound appreciation of, and acknowledgment to, industry. This attitude is reflected in the feelings of your legislatures toward your mills. The lack of this feeling of good will and encouragement toward the New England mills is their principal, if not their only, handicap. I have a feeling, perhaps it is only a hope, that the tide is turning and that soon our New England legislatures will really try to encourage and foster industry. There are distinct signs of this in some of the States. Until this occurs, there will be few, if any, new cotton mills built in New England."

Active Southern Spindles Increase.

The extent to which the cotton textile industry is shifting from New England, where it first became great on this continent, to the South, is indicated by the United States Census bulletins. Back in 1880, 81 per cent of all the cotton spindles in the United States were in New England, and only 5 per cent in the Southern States. By 1900, the Southern proportion had grown to 26 per cent and New England's had fallen to 66 per cent. Ten years later the percentages were: New England, 56, and the Southern States 36. By 1920 Southern spindles were 43 per cent of the American total and New England's, 51 per cent. At the end of October this year the gap between the two was narrowed, for then New England's spindles represented only 48 per cent of all and the South's, 46 per cent of the total for the United States.

The year 1923 was not a good one in the cotton textile industry. As against 35,707,738 active cotton spindles in the United States in 1922, only 34,378,862 were active in October of last year, making a decrease of 1,328,876.

But even while this decrease was going on, the Southern mills were forging ahead. In October they operated 16,084,942 active spindles, an increase of 178,777 over the 1922 figures. On the other hand, the number of active spindles in New England in the same time dropped from 17,938,805 to 16,579,516, a loss of 1,359,289.

The stupendous changes that have been mentioned are producing a new set of economic and political problems for the South, but the South is approaching them intelligently. The South wants, and is getting, industrial development; but it wants that development in what it believes

*Reprinted from The Nation's Business.

is the right way. Briefly put, the South wants to man its industries with Americans and to preserve itself against an excessive influx of aliens and against labor disturbances.

A fundamental fact in the problems is that the three leading Southern industrial States, Georgia, North Carolina and South Carolina, are practically all-American communities. The foreign-born population of the United States, as shown by the census of 1920, is 13,345,543, or 12.6 per cent of the total. Now, of Georgia's census-found population of 2,895,822, only 16,564, or not quite six-tenths of one per cent, are foreign born. Of South Carolina's population of 1,683,724, only four-tenths of 1 per cent, or 6,582, are of foreign birth. In North Carolina there are 7,272 natives of foreign countries, or not quite three-tenths of 1 per cent, of the State's total population of 2,559,123.

The problem that most concerns the South today was tersely set down by Winston D. Adams, secretary of the American Cotton Manufacturers' Association, at its annual convention at Richmond, when he said:

"Our industry is growing so rapidly within itself that while today we may have a sufficiency of native help, the day is not far distant, in the judgment of many, when there will be a scarcity, if not an actual dearth. Any considerable accretion from without to the Southern industry, with consequent demands upon our native labor supply would probably result in a general shortage for which there would be but one solution from the standpoint of the Northern mill man and that would be to bring in outside help; and the one thing that we are definitely agreed on is the extreme undesirability of any influx whatsoever of Northern labor of foreign extraction.

South Supplies the Skill.

"Confident that I voice the sentiment of the vast majority of our members, I state that outsiders are welcome to share in the extension of the Southern textile industry within the limits of our ntaural labor supply, but that any disposition on their part to come at the expense of bringing in outside operatives to remedy any resulting labor shortage would be vigorously and actively resented."

T. E. Browne, State director of vocational education in North Carolina, recently declared that "it would be nothing short of a tragedy were it to become necessary for the New England capitalists to have to bring to the South New England's skilled labor to fill the more highly specialized positions within our borders."

"In too many of the schools located in the textile centers of North Carolina," said Mr. Browne, "the teachers have been emphasizing the importance of an education as a step into industrial enterprises.

"These boys have been taught to look upon an education as a means of getting out of the industrial environment," the director said. "A more false conception of the situation could not be thought of. For the bright, ambitious boy in a cotton mill community, fully acquainted with the fundamental conditions of industrial life, there is no greater opportunity than for him to direct his education to the preparation for leadership in the State's great industrial development.

"The teachers in these communities should begin early to acquaint the children with the bigness of the textile industry, the opportunities for promotion for the highly skilled worker and the ever-increasing demand for men of ability and vision to direct the activities in the State's large industrial plants.

"There is no State with purer Anglo-Saxon population, with boys and girls with greater native ability, than North Carolina. These enlarged industries are necessarily going to demand workers of increased skill. It is the duty of the school to use its influence to train both the young and the adults of our State who will be called upon to man these industries to become well trained leaders."

The leading men in the Southern cotton textile industry are in accord with this idea. Whatever evils there may have been in the past in the matter of child labor in the mills, the spirit of the Southern cotton industry today is attuned to providing the mill workers with a better and a more wholesome life.

It is not pure altruism that leads them to the course they are now following. They realize that to prevent their labor problem from becoming more complex and to avoid the importation of alien labor they must make life in the mill villages and employment in the mills so attractive and so remunerative that the oncoming generations will be content to remain in that industry. "It is the child which is the hope of future Southern industrialism," declares Stuart W. Cramer, of Cramerton, N. C., a leader in the industry.

"We all know New England's experience," continues Mr. Cramer, "where the textile workers of a generation ago have been superseded by foreigners, and their children have drifted out of the mills into other employment. The health, training and opportunities we bring to the children of today will determine very largely whether they will care to be the mill workers of tomorrow. Any Southern mill man, therefore, who fails to support child welfare work and to observe the child labor restrictions that have gradually emerged from the chaos of experimentation, both legislative and industrial, whether compelled to do so by law or not, is a traitor to his industry and to his own selfish interests."

Hence the large expenditures which Southern mill owners have made and are continually making in the way of better housing and what is broadly termed welfare work for their employees. They declare that on an average one-third of their capital investment in a mill property goes into the mill village.

In establishing a mill in the South experience has shown that it is useless to put it near a city in the hope of drawing on the population for labor. The Southern white city dweller does not seem attracted by the employment, and by an unwritten rule, also based on experience, only whites are employed in cotton mills. Hence, each mill has its own village; and the modern development is for that village to be completely equipped with sewerage, light and water systems, churches, schools, community houses, hospitals, recreation fields and moving pictures.

The mill owners assert that while admittedly their wage scales are lower than in the North, their labor costs are not, because they provide the equivalent of $4.36 per week per operative "outside the pay envelope," for his physical and mental comfort and welfare.

How all this is working out may be summed up in the words of Dr. James A. Hayne, executive officer of the State Board of Health of South Carolina.

"The rise of the cotton mill industry, in South Carolina at least," he said, "has been of enormous benefit in improving the health of our people. Please observe that when South Carolina became a registration State in 1915 (that is, when it began to keep vital statistics), the death rate was 15.4, and that it has now been reduced to 11.5 per thousand of population—white, 9.4; colored, 13.6. This is as low a death rate as can be found for a white population in any State in the Union. In 1916 the total number of deaths of children under one year of age was 4,300; in 1922, it was 3,483, which means that 817 babies were saved.

"Deaths of children from one to ten years of age for 1916 were 2,612; for 1922, 1,737. These are but examples.

Mills Advance Civilization.

"The truth is that were the general health of the State as good as it is in the mill communities, our statistics would make even a better showing, for it is an absolute fact that health conditions in the mill villages are materially better than in the other communities. For example, while the death rate in all the United States in 1922 was 11.9, that in Spartanburg, a mill center, was only 10.

"The mills have advanced civilization in this State and not retarded it. Their coming is directly responsible for a vast improvement in the living conditions of our people. The mill owners a long time ago found out that as a commercial proposition alone it is good business to see that their workers and the families of their workers are healthy, happy and contented. The mill village of today is a clean, architecturally pleasing and modernly equipped community, with modern plumbing, modern sewerage and all the conveniences of life. Time was when the mill workers were a floating population. Today the labor turnover has been vastly reduced. As a rule the floater has been eliminated.

"Here, as in other Southern States, the cotton mill labor is made up almost entirely of native whites, that pure Anglo-Saxon strain that has lived a primitive life in our mountains for hundreds of years. They are an independent race, uneducated, to be sure, in their original environment, but highly intelligent as shown by the manner in which they develop intellectually as well as physically when they have the benefit of schools, churches and associations that are found in our mill communities.

"You Northern writers are fond of declaring that these people live under a system of almost feudal paternalism in homes and towns furnished by the mill owners. It is an absurd statement to make when one takes into consideration the traditional individualistic spirit of these people. They will submit themselves to leadership in which they have confidence, but it is not in them to submit themselves to autocracy or imposition.

"But if they believed for an instant that they were being exploited, or repressed, as some of the Northern writers have declared, they would not remain. There is nothing to compel them to remain. They can pick up their belongings and go back to their mountains and freedom, if you want to use the word, whenever they feel like it. The fact that they do not do so is a complete answer to misrepresentations that have been afloat."

The World Cotton Situation.

The Department of Commerce has now completed through its domestic and foreign staff, in co-operation with the Department of Agriculture, a preliminary world raw cotton survey for the four months ending November 30, 1923. The estimates are based upon information obtained from the representatives of this department from consular officers abroad, from official reports, and from reliable trade sources.

Estimated world's supply and distribution of cotton, four months ending November 30, 1923 (bales of 478 pounds net):

	Amer. Bales	All Kinds (including Amer.) Bales
Stocks July 31, 1923	3,065,000	6,341,000
Production for commercial use for the 1923-24 season (1)	10,081,000	18,075,000
Total supply	13,146,000	24,416,000
Consumption during the four months ending Nov. 30, 1923	3,710,000	6,310,000
Supply on Nov. 30, 1923 (2)	9,415,000	18,185,000

(1) The production figures estimated total crops, with the exception of India and China, where only the cotton produced for mill consumption and export is considered, cotton used in household consumption not being included.

(2) The estimated supply on November 30 was arrived at by compilation and includes stocks in mill, ports and warehouses; also cotton estimated to be elsewhere. The latter quantity was obtained by deducting the cotton accounted for up to November 30 from the estimated crops.

If the supply on November 30 is obtained by subtracting the consumption from the total supply the resulting figures will differ somewhat from those given here because it is not possible to get a complete balance on account of insufficient data.

Mercury Boiler May Revolutionize Power Production

POWER from mercury vapor, making possible a double vapor power plant in which turbines for generating electricity are driven both by mercury vapor and water from the same fuel source, resulting in a gain of about 50 per cent in power per pound of fuel, is the outstanding achievement of a new boiler perfected by the General Electric Company.

Two such boilers have been built to date, an experimental apparatus operated at the Schenectady Works of the General Electric Company and an experimental installation now under observation at the Dutch Point generating station of the Hartford Electric Light Company, at Hartford, Conn.

This installation is the first of its kind in the world. Experiments have been conducted by the General Electric Company over a period of several years. The success of these experiments warranted the manufacture of a set of commercial size and it was arranged between the two companies that this installation should be made in Hartford.

The equipment at Hartford is now being operated with a partial load for the purpose of getting experience with continued running without mercury risk or injury through overloading.

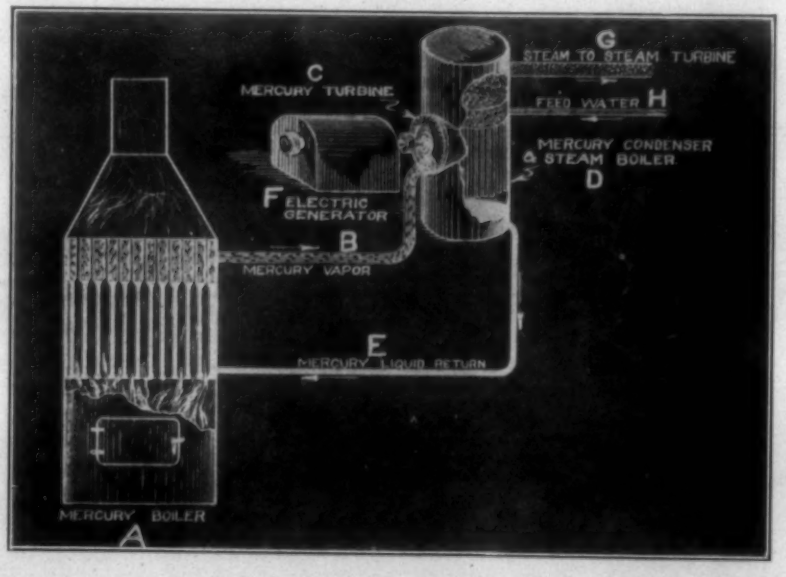
The rising cost of coal and its transportation makes it more and more desirable to reduce to a minimum the fuel consumption for the manufacture of power. Any substantial savings warrant a very large investment in power station equipment and the experience of considerable sums of money in devising methods of operation with better fuel economy.

W. L. R. Emmet, consulting engineer of the General Electric Company and inventor of the mercury process, estimates that if the mercury boiler comes up to all expectations, it will produce with 35 pounds gauge pressure, when compared with a steam turbine generating plant which uses 200 pounds steam pressure, about 52 per cent more output in electricity per pound of fuel.

"And if," Mr. Emmet adds, "in such a plant the boiler room is re-equipped with furnaces and mercury apparatus arranged to burn 18 per cent more fuel, the station capacity with the same steam turbines, condensers, auxiliaries, water circulation, etc., would be increased about 80 per cent."

The process is novel in every particular, and it was necessary to elaborately study the characteristics of mercury and its vapor. During the earlier experiments it was found that no form of packing or corking of the joints would resist the mercury vapor and it is the development of arc and acetylene welding which has made such apparatus possible.

It was necessary for the inventor not only to design and manufacture the apparatus, but also to devise methods of operation, as there was naturally no precedent by which to work. The apparatus was shipped and erected and was started and successfully operated just as designed.



The mercury vapor process involves the vaporization of mercury in a boiler, driving of a turbine by the mercury vapor and the condensation of the exhaust in a condenser where its latent heat is delivered to water and thus used to generate steam at pressure suitable for use in existing steam plants.

The condensed mercury runs back by gravity into the mercury boiler. Thus the mercury vapor acts as a heat conveyor and, at the same time, delivers energy to the mercury turbine. This affords a means by which the temperature range of operation is more than doubled as compared with ordinary steam processes, and the efficiency consequently greatly increased. Means are also provided by which the flue gases are brought to temperatures equivalent to those used

(Continued on Page 43)

WHO'S WHO AMONG TEXTILE SALESMEN

ALBERT MILMOW.
(Sales Engineer)

Albert Milmow is a well known electrical equipment specialist who makes his headquarters at Charlotte

ALBERT MILMOW.

and calls himself a "sales engineer," meaning that he combines his electrical engineering experience and knowledge with his sales so as to render service to his customers.

Albert was born in London, England, but his parents brought him to this country at two years of age.

After taking an electrical course at the General Electric Company's works he spent some years operating and installing plants in foreign country, notably in South America and the Philippines. He came to Charlotte in 1906 to open the present office of the General Electric Company, and from there he went to the Southern Power Company, where he was engineer of the mill power department for five years. Later he was associated with the Westinghouse Company and is now conducting the Charlotte office of the Packard Electric Company and the Robbins & Myers Co., at 217 Latonia building, Charlotte, N. C.

Mr. Milmow has been closely identified with applying electric drives to textile mills since its beginning, being one of the pioneer engineers in this field, and being responsible for many of the existing installations.

O. G. CULPEPPER.
(Parks-Cramer Co.)

O. G. Culpepper, of the Parks-Cramer Company, began his present

O. G. CULPEPPER.

line of work as a machinist with Stuart W. Cramer.

While Mr. Cramer was experimenting and developing his humidifying and automatic regulating systems Mr. Culpepper was one of the machinists, but because he was not content to remain a machinist he devoted himself to a study of the experiments that were being made, and as the Cramer system developed, so did he develop into an expert on automatic regulation of humidity.

After about five years of such study he was placed in charge of all road work and continued in that capacity when the Parks-Cramer Company consolidation was perfected.

About one year ago he was promoted to the sales department and is now in charge of sales in the central and eastern part of North Carolina.

He was born at Charlotte, and not being financially able to attend college, had to learn his present business through application and hard work, but his steady advancement has demonstrated his ability.

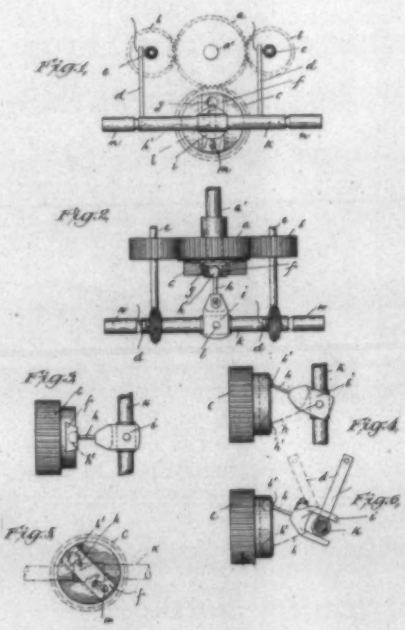
In one respect, however, he seems to have failed, for he is still numbered among the bachelors, but his friends say that, in spite of his loss of hair, he is still optimistic.

Automatic Bobbin-Winding Machine

Ludwig Haussler, of Plauen, Germany, has invented an automatic bobbin-winding machine, of which the following is a specification:

The invention relates to an automatii bobbin winding machine and particularly to meadns for transmitting oscillatory motion to the spindle carrying the thread guides.

With automatic bobbin winding machines, it is known to impart oscillatory movement to the spindle of the thread guides by crank operated gears or eccenter. When using a crank a connecting rod is always required and the latter participating in the oscillating movement produces flying masses which disturb the quiet operation of the machine when in rapid motion. On the other hand when the guides are driven through the medium of an eccenter much friction is produced, the guides easily wear out and the movement is also unquiet.



This invention has for its object to obviate these drawbacks and consists in a novel means for transmitting oscillatory motion to the spindle of the thread guides whereby the objectionable flying masses and friction are eliminated and the machine can work with a greater number of revolutions than when using the ordinary transmission means heretofore mentioned insuring the quiet uniform movement necessary for the precise winding of the bobbins.

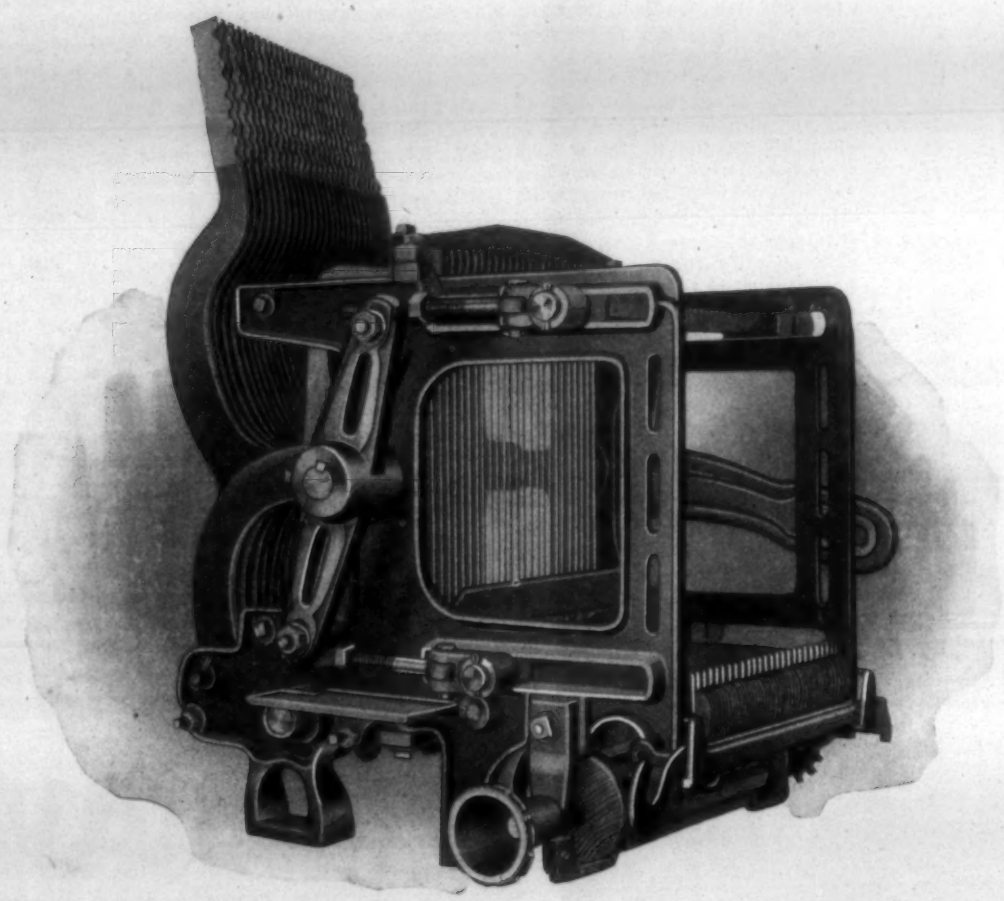
The invention is illustrated more or less diagrammetrically in the accompanying drawing, in which, Fig. 1 is an elevation; Fig. 2 a top plan view thereof with a part shown in section; and Figs. 3-6 are diagrams illustrating the operation of the machine.

Referring to the drawing more in detail (a) denotes a gear fixed to the main driving shaft (a) of the machine and which meshes with the gears (b) fixed on the bobbin spindles (e). The gear (a) also meshes with a gear (c) which forms part of the mechanism for transmitting oscillatory motion to the spindle of the bobbin guides. Adjustably mounted in the gear (c) is a member (f) having a hole (g) to serve as a socket. Extending transversely of the gear (c) is the spindle (k) carrying the thread guides (d) and rotatively supported at both ends of the pointed supports (n). Embracing the spindle (k) and pivotally connected thereto by a pin (l) is a forked piece (i). This piece is provided with an arm (h) the free end of which is formed to a ball (h) which engages the socket (g) so that when the gear (c) revolves the arm (h) wll swing in a circle and through the forked piece (i) impart oscillatory motion to the spindle (k) (Figs. 4 and 6). The member (f) may be displaced in the gear (c) and locked in position by a set screw (m) (Fig. 1), the displacement affording an adjustment of the socket ()g nearer to or farther from its central position, in order to cause the arm (h) to describe a larger or smaller circle and thereby control the stroke of the thread guide according to the particular bobbin length. There may be several thread guides on the spindle (k) according to the number of bobbin spindles used.

Italian Exports of Raw Silk.

Fluctuations in the exchange market seem to be influencing sales of Italian silk. Orders, particularly those from the United States, come to a stop as soon as the lira takes a jump in value. The high cost of cocoons is also making it difficult for the Italian industry to meet Japanese competition except in the finest qualities of silk, Assistant Trade Commissioner Palmer informs the Commerce Department. Exports for the first 11 months of 1923 were 2,749,200 kilos (kilo equals 2,2046 pounds) of raw silk and 1,827,200 kilos of thrown silk, compared with 1,884,600 kilos and 2,049,300 kilos, e-spectively, in the corresponding period of 1922.

CROMPTON & KNOWLES DOBBIES



New Features of Special Interest To Weavers And Fixers

1. We are now prepared to equip the dobby shown above with pressed steel hook levers (patented) and drop forged top and bottom hooks (patented).

2. Built with slotted fingers and locking rod (patented), making it easy to remove, clean and replace the fingers.

We call attention to the carefully machined swivels and studs used for operating the dobby knives.

This dobby can be applied readily to any make or type of loom.

CROMPTON & KNOWLES LOOM WORKS

WORCESTER, MASS.

PROVIDENCE, R.I. PHILADELPHIA, PA. PATERSON, N. J.

S. B. ALEXANDER, CHARLOTTE, N. C., Southern Manager

The Evolution of Bleaching

By S. H. Higgins.

IN his book, "The Ancient Egyptians," Sir J. G. Wilkinson mentions a process of smoothing or calendering cloth as represented in paintings preserved from the period. The smoothing was done by means of wooden rods passed to and fro over the surface of the cloth, but from the appearance of some of the fine linen found in the tombs, it may be conjectured that much greater pressure was sometimes used for this purpose, such as could only be applied by a press or cylinders of metal. For smoothing linen a wooden instrument, similar in form to our present-day iron, was used, and some of these, six inches long, and made of tamarisk wood, have been found at Thebes. These, however, were used principally by washerwomen, who also had a wooden instrument for goffering the fine linen used in the dresses of kings and priests. Many persons, both men and women, were engaged in cleansing cloths of various kinds, and the occupation of the fuller forms one of the numerous subjects of the sculptures. It is probable, however, that they were only a sub-division of the dyers. In early times, before and even after the invention of soap, potash, nitre and several earths were employed for cleansing cloths, as well as various herbs, many of which are still in use among the Arabs, one doubtless being the alkaline plant boreeth, mentioned by Jeremiah (ii., 22) and Malachi (iii., 2). Many of the suaedas and salsolas and other alkaline plants are found in the Egyptian deserts, as well as "gilloo," also called "the soap plant." The people of Cairo and the Barbary Coast also used certain woods for cleansing manufactured stuffs.

Sir William Gell's "Pompeiana," London, 1832, gives an account of washing and dyeing in Pompeii. The fullonica, where the washing was carried on, consisted of a building of some size made of white marble, a fountain and cisterns for washing and dyeing.

This year the fullonica of Holconius has been found at Pompeii. On the facade of the building there are notices and advertisements in red wash. Three large troughs and a number of smaller ones are so situated as to facilitate the flow of water; they are built of terra cotta and plaster, and served with a number of lead conduits. Behind the troughs is the kitchen, with earthenware pots and pans on the stove. On the roof above the troughs and kitchen is a large terrace for drying the material.

Soap, the discovery of which is ascribed to the Gauls, appears to have had no other use among the ancients than that of a pomade for cleansing the hair or for staining it with different colors; but later it was used for cleansing cloth. The remains of a soap factory have been found at Pompeii. Pliny states that the soap was made from tallow and the roots of certain poppies, sometimes from radicula (which is supposed to be identical with our saponaria). He states that white linen was more highly esteemed than colored cloths. Since a white basis is necessary for good dyeing, and since the Egyptians and Phoenecians were famous for their dyed goods, it is manifest that these nations had some knowledge of bleaching. Pliny mentions that the ancient Gauls and Britons also used the ashes of plants in bleaching their linen cloths, and he himself describes a process of burning lime for use in bleaching. Theophrastus, 300 B. C., relates that a ship partly loaded with linen and partly with lime for bleaching was destroyed by the accidental access of water to the lime. In Europe, the juices of wake robin and other plants were said to have the property of dissolving the resinous coloring matters of the fabrics and rendering them white; sometimes the scouring action was assisted by pounding the yarn in a stone mortar with water or water containing the roots of wild poppies. Dung was used later, because of the ammonia it contained, and finally the universal scouring agent became the ashes of plants, these ashes being usually supplied by farmers after burning weeds. Later, soda ash produced by burning seaweed became a lucrative industry carried on along the coast, this ash being largely used for scouring.

Flax and hemp were used for making fabrics in the earliest times, and the cotton shrub was cultivated in ancient Egypt for the production of garments, although the gray fabrics were mostly used. The effect of hot water and exposure to the sun in whitening these fabrics, however, would soon be noticed, and when the fabrics were exposed on alkaline soils the effect of the alkali would also be seen. It is not difficult to understand, therefore, that a regular system of bleaching resulted. Early bleaching was performed somewhat on the lines followed by the present-day housewife, who boils her clothes with weak alkali and exposes them to the sun. During the exposure she sprinkles them with water to keep up the bleaching process. This domestic system became industrial, the cloth being al-

ternately boiled and "grassed" until a good white was produced.

In most countries there was a prejudice against the use of lime for bleaching, for the lime was supposed to injure the material. According to an Act of Parliament, passed early in the eighteenth century, "Lappers may enter in buckhouses, bleachyards and other places and search the same for lime, pigeon's dung, soap dregs, and upon proof before one or more justices of the peace that any of the above materials have been mixed or used with any lees in bleaching, the offender shall pay £5 sterling (and the cloth so bleached) to the informer, and also be rendered incapable of bleaching for two years following." Attempts were made to enforce this law, but without success, and the use of lime gradually spread, owing to its cheapness as compared with potash. It was early noticed that by adding lime to the lyes, the carbonate was changed to the caustic alkali which was a more effective scouring agent, but this was not permitted, and lime was not allowed in any way. John Williamson, bleacher of Lambeg, made efforts to legalize the use of lime by bleachers against the law which contained the clause "that any bleacher who used improper materials was to be adjudged guilty of felony and to suffer death." Horner says, "A deputation was sent to Dublin, however, and brought about the rejection of this objectionable clause." Williamson having gained permission to experiment with lime bleaching, without incurring the penalties laid down in the Act of Anne, brought the results of his labors before the Linen Board, producing as evidence 200 pieces of linen bleached by his process at Lambeg, along with a quantity of similar goods bleached by him in the ordinary way. These were examined by a number of merchants, who declared that Mr. Williamson's lime-bleached linens were "by far the whitest in color, and quite superior to the others in soundness and strength." In spite of this evidence the Board refused to sanction the use of lime in bleaching, and although the board awarded £300 to Dr. James Ferguson, of Belfast, in 1770, for an application of lime in the process of bleaching, no use was made of these experiments, and the law of Anne still remained in exsitence. As late as 1815, Mr. Barklie, of Keady, was prosecuted for the use of lime in whitening linens in his bleachyard. An Act of William and Mary, 1695, prohibited the use of lime for bleaching linen in Scotland under a fine of £40.

Carter states that at the beginning of the seventeenth century the Dutch enjoyed a world-wide reputation for their skill as bleachers, and the bleachers of Picardy and St. Quentin were also renowned at this period. Francis Home, in 1756, in what is perhaps the earliest work on bleaching, describes the practice of the time in the Netherlands and in Ireland as follows: "Fine linen in Belgium and Holland was placed in separate pieces and then laid in a large wooden vat and covered with hot water mixed with lye, already used for white cloth or with rye meal and bran mixed in. The cover of the vat being closed, fermentation began, and when in 36 to 48 hours it abated, the cloth was taken out, washed, and spread in the field to dry. * * *" A stock lye was made of a mixture of ashes it would be difficult to identify now—a small portion of white pearl ashes along with a much greater weight of Marcroft ashes or of cashub, and two-thirds more than this of Muscovy or white ashes. Two gallons of this stock were diluted with 38 gallons of water and two pounds of soft soap added. The linen was heated with the lye by packing it into a wooden box with a tap at the bottom, pouring the lye over it at a blood heat, drawing it off at the bottom, reheating and again pouring it over the cloth, continuing the operation again and again for six or seven hours, the heat of the lye gradually increased until at the finish it was at boiling point. After this came the crofting. The linen was spread upon the grass and kept wet during the daytime, but the evening dews were sufficient to keep it moist during the night. In very dry weather, of course, the watering had to be continued through the night. It was watered again the next day and then taken up and bucked once more. This alternate bucking and crofting was continued from 10 to 16 times, the strength of the lye being increased up to the middle bucking and then decreased. The cloth was judged to be ready for souring when it was nearly freed from spirit or outer bark of the lint. It was then soured by covering with buttermilk and working it with the bare feet. Sour milk was, of course, equally serviceable, and sometimes a a sour made with bran or rye meal and water was used. When the cloth was thoroughly steeped the cover of the box was put on and fermentation set in. When no more bubbles appeared the operation was considered to be finished. This souring operation took five or six days. The cloth was then soaped, and the whole cycle of operations—bucking, grassing, souring and soaping—was repeated until the cloth was quite white. The whole process of bleaching was in those days a matter of weeks.

The Irish process was somewhat similar, but dealt with coarser cloths. The Dutch method described was the method employed around Ghent in the days when that town was surrounded by hundreds of acres of bleaching crofts, and in the days when Ireland and Flanders were celebrated for the fineness of their linens. The bleachfields were in the middle of an agricultural country where buttermilk was looked upon almost as a waste product. This method of bleaching was regularly practiced until nearly the end of the eighteenth century, although about the middle of the seventeenth century Dr. Home, of Edinburgh, suggested the use of weak sulphuric acid for souring in place of buttermilk. Skill in finishing had also been attained at this period, for it was found necessary in the first year of Elizabeth's reign to pass an act which set forth that

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Eight Phases of Mill Operation

SEVERAL phases of mill management are discussed in a very interesting and valuable manner in a booklet, "Picks to the Minute," just issued by J. E. Sirrine & Co., engineers, of Greenville. The following information is reprinted from this booklet by special permission of this well-known engineering firm:

Subsistence, clothing, shelter and transportation are the four primary needs of man.

The textile industry caters to all of these by supplying fabric for clothing, drapery, upholstery, for tires, for bagging and for the thousand and one domestic and industrial uses.

These conditions have given the textile industry a relatively steady market and a more nearly regular profit than is vouchsafed to many other industries.

The advantage which an individual enterprise may possess as an integral part of the entire textile industry remains an advantage only in so far as competition within the ranks is properly met.

One factor that has not infrequently hampered textile mills has been the lack of sufficient margin for the mill to control its market. It has, in many cases, been obliged to sell the easiest way; but the remedy of a wider margin of profit may be available in a greater production or in a greater economy with the same production.

Increase of total production may possibly be accomplished with the present equipment of a mill. It may require new machinery. or conditions may even necessitate a new mill with more spindles and looms.

To secure better results with present equipment necessitates the introduction of methods which will make the machinery already installed operate more efficiently.

To modernize an old mill, so as to achieve and maintain a standard of high efficiency, requires a well-conceived plan.

To build and properly equip a new mill calls for a pre-developed plan, embracing all departments of production and anticipating the growth of the business over a period of years, allowing neither too much for the present nor too little for the future.

Too many factors enter into the successful and efficient operation of a textile mill to be discussed here in detail. Some of these factors are common to all mills, others are peculiar to certain branches of the industry. Most of them are within the mill, but many are the results of exterior influences, such as geographical location, water supply, living conditions and climate. Their importance deserves careful attention of both management and engineer.

Aside from the problems of management, which have no part in this paper, eight phases of textile mill operation furnish the greatest opportunities for increasing production through improvements:

Buildings.
Machinery equipment.
Character of drive.
Air conditioning.
Light.
Power.
Arrangement of departments.
Labor.

Proper changes in these items will frequently result in advantages highly important to the mill that does, or may sometime, have to face the efforts of competition. Chief among the possible benefits will be:

Increased production per operative.

Increased production per unit of power.

Lower cost per unit of production.
Increased average quality.
Fewer rejects and seconds.
Lowered maintenance.
Greater freedom from labor trouble.

Buildings.

In building a new mill, too much emphasis cannot be placed on the selection of permanently solid floors, with a minimum of vibration, assuring a maximum life to machines. Solid floors with reduced vibration not only increase the productive machine life, but reduce repair costs and obviate realignment and reveleling.

Machinery costs too much to wear it out through unequal settlements.

The entire construction of the building should conform to the mechanical operations and be influenced by the character of the goods produced.

If the question is one of choice between reinforced concrete or slow-burning mill construction, it is well to remember that reinforced concrete construction assures more economy in longer life for both building and mechanical equipment, nearly always justifying, by the savings, the relatively small additional expense.

Machinery Equipment.

It is essential in equipping a new mill to install dependable machinery, preferably types which have been tested in service. This is equally important if present equipment of an existing mill is to be replaced.

It is often possible to modernize the existing machinery of an operating mill by new attachments and devices. Automatic attachments can sometimes be added to old looms.

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Market More Active

"Market activity has increased decidedly during the past few days. The impression that the decline is in its last stages has been gaining ground steadily, so that when we have a day like yesterday with a good steady cotton market, the result is a very considerable volume of orders. Unsold stocks at the mill are now decreasing," says the weekly letter of the Hunter Manufacturing and Commission Company.

"Irrespective of whether cotton may or may not decline a little further, present prices for goods, in so many cases, have already more than discounted any price likely to be seen, that the buyers are well aware that it would require little to bring about a decided change. Some of the largest and most important interests, for instance, must be buyers of print cloths within the next few weeks. The entrance of any one of these into the market would be almost sure to mark the start of a volume of buying such as has not been seen for several months.

"For the time being, the improvement is entirely in the volume of inquiry. It is too early to look for anything in the way of price improvement yet; as a matter of fact, while print cloths have held their own pretty well during the week. Sheetings have shown some signs of weakness. The recisions here, however, have merely put them more in line with print cloths and have led to a very considerable volume of business which we estimate at not less than three hundred thousand pieces of sheetings alone for the week. The most important of these orders came from the bag trade. The rubber trade also figured in the buying—jobbers and mail order houses to a less extent.

"No move has yet been made on percales and the previous keen competition for business on ginghams continues. Export orders from South and Central America are more plentiful, though the quantities are small. We are glad to report some business from Manila, which has been a quiet point for sometime.

"Complete data for January trade which is now available is very satisfactory. Both production and distribution show a good gain over December and also over January, 1923, and it seems likely that the same favorable forces were at work in February.

"Automobile manufacturers are working at capacity steel and iron are fully holding their own. Building, as you know, is at record pitch, and freight carloadings week after week approximate record figures for the season. Nevertheless, the buyer consistently maintains his policy of hand-to-mouth purchasing —be the final result what it may. The greater part of the grey goods sales made during the week have been for March-April or April-May delivery.

"The Federal Reserve Board fixes the increase of wholesale trade in January over December at 11 per cent and slightly higher than January, 1923, though sales of dry goods and shoes were smaller than a year ago. Retail sales were 7 per cent larger than a year ago, and stocks of merchandise in retail stores, though reduced during the month, were 6 per cent greater at the close than on January 31, 1923. Mail order house sales for January exceeded those of a year ago by 11 per cent. In this district, by itself, silk goods and men's clothing showed a gain at wholesale, while cotton goods and shoes showed a decline as compared with a year ago. At retail, men's and women's clothing furnished the greater part of the gain as compared with a year ago."

Czech Cotton Mills Find Competition Difficult

Vienna.—Czecho-Slovakian cotton mills are continuing to work with the same intensity as during the last months of 1923, although market conditions in Central Europe and in the Balkan countries are less favorable, says A. Mautner, of Isaac Mautner & Son, one of the large textile concerns in this part of Europe, with mills in Austria, Czecho-Slovakia, Germany, Hungary and Rumania.

Western European cotton firms, especially British and French industries, have become very keen competitors in Central Europe and the Balkans, and while the former sell much of their stocks at cost, or even below cost, to get more employment for their workers, the latter profit from the franc slump, which gives them a chance to underbid almost everybody with the cheap reparation coal, Mr. Mautner says, the French cotton mills produce now at lower costs even than the Italians, who have the advantage of hydro-electric energy. Both British and French firms seek new clients by granting long credits, or a 5 per cent discount in the case of cash payments.

Under these conditions competition became very difficult for the Czecho-Slovakians, whose prices are about the same as in the second half of last year. Most mills in Czecho-Slovakian cotton producers, the Mautner firm does not think that raw cotton prices will go down. According to reports to the firm, the demand for raw cotton will continue to be bigger than the available supplies, and prices will be liable to further increases. The Italian firms, realizing this probability, have already covered or are now covering their need of raw cotton for the whole term up to the new harvest. They apparently expect a corner for May or June, and the Mautner firm is of the same opinion and acting accordingly. Although the prices of finished Czecho-Slovakian goods have so far shown no appreciable rise, increases may be unavoidable later on.

With their world-wide selling organization, the United Textile Works have been able to hold and even to extend their former position, and they maintain a brisk export trade to most parts of the world, also to the United States, where checkered skirtings, tickings and similar articles are disposed of in considerable quantities.

Visiting the Textile Machinery Shops

By David Clark, Editor

(Continued from last week)

LEAVING Boston at 1 o'clock on January 31st, I reached Lowell about 1:40 p. m., and walked five blocks to the office of the T. C. Entwistle Company.

T. C. Entwistle Company.

I found all the office men away at lunch but the stenographer phoned Frank Kenney and in a few minutes he appeared, accompanied by Geo. Foster, of the Universal Winding Company, and they said they had been at lunch wth Sid Alexander, of Charlotte.

A little later M. F. Cummings, the treasurer, and Clarence Howe, the vice-president, came in.

There is no doubt that the T. C. Entwistle Company has an unusually strong and live organization.

Frank K. Kenney, the president and largest stockholder, has been with them for many years and has handled the affairs since the death of Mr. Entwistle. His loyalty was so appreciated by the widow of Mr. Entwistle that she arranged matters so that he could secure the stock of Mr. Entwistle.

M. F. Cummings has been with the company seven years, having been acquired from another line of business because of his executive and business ability.

Clarence Howe was for about 20 years with the Crompton & Knowles Loom Works and is rated as one of the best salesmen in the textile machinery business. He was elected Potentate at the recent meeting of his Shrine.

The T. C. Entwistle Company was organized in 1888 and has been recognized as the leading builders of beam and ball warpers. They now occupy quarters where Mr. Entwistle first began to manufacture his warpers and have a very complete shop.

Frank Kenney showed me over the works and explained details.

In the first room they were operating a beam warper with a new style creel in order to determine if any improvements could be made.

The manufacture of the creels for warpers requires a large amount of special wood working machinery and very careful selection of the wood to be used.

In passing through the wood working shop, I met the superintendent, J. W. Sidbottom, who was with Mr. Entwistle when he began to make warpers, and Mr. Sidbottom told me that there were quite a number of other men still in the shops who began with Mr. Entwistle.

Later I met Tom Mahoney, who had been with them for 23 years; Herbert Howell, for 30 years, and A. E. Brook, who had worked with them for 37 years.

Mr. Kenney was evidently and rightly proud of the long service of these men and it was easy to see that the entire personnel of the workmen was much above the average.

In making special machinery such as warpers it is a great asset to have workmen who from many years of experience know every detail of the business and no doubt the high quality of Entwistle warpers is due to a considerable extent to such men as those mentioned above.

At every point in the machine shop were special machines and special devices for insuring accuracy. For instance, in putting the pins in the combs there is an indenting device to insure every pin hole being drilled exactly right. Even the cutting of gears is done with extreme care.

A recent development on the warpers is a traveling fan operated by an endless belt. Formerly the traveling fan was run by a double screw shaft but the substitution of an endless round leather belt reduced the cost and requires less power.

While the T. C. Entwistle Company is best known as manufacturers of beam and ball warpers, they also are well known as manufacturers of card grinders.

In addition they make expansion combs, indicating clocks, beaming machines, section beams, wood rolls and doubling machines.

It would seem that a company specializing on a few machines would not have to carry a large stock of supplies, but the T. C. Entwistle Company pride themselves upon giving service to their customers and therefore carry a large assortment of parts and the patterns and blanks for manufacture occupy a very large space.

It appears to me that the paramount feature of the T. C. Entwistle Company is the personnel. In the office they have men whose ability and standing would do credit to any of the large shops, and in the shops they have skilled workmen who take pride in the quality of the T. C. Entwistle machines.

Just before 3 o'clock Clarence Howe and Geo. Foster drove me to a corner at which I was able to catch a trolley for Graniteville, Mass.

C. G. Sargent's Sons Corp.

After changing cars at North Chelmsford, I reached the little village of Graniteville, Mass., about 3:45 p. m., and at C. G. Sargent Son's Corporation, I was fortunate in finding the president, Mr. C. G. Sargent, in the office. Mr. Sargent is the grandson of the originator of the business which has been established for many years.

Mr. Sargent assigned H. R. McCurdy to show me over the shops. It happened that it was Mr. McCurdy's last day with them, as he had resigned to become U. S. agent for the Balwin Heap Beam Dyeing Machine Company, of England, and has since then opened an office in Boston.

The shops of the C. G. Sargent's Sons Corporation are located across the street from the office and are built of stone.

They build drying machines for cotton, wool and other fibres.

In recent years they have produced a new cotton dryer with metal sides and also a wire apron that is built in sections.

They are also building filling conditioning machines and have a large number of them installed in Southern mills.

They have a small but complete foundry and a well equipped machine shop.

Returning to the office, Mr. McCurdy showed me a small model of a swinging shelf conveyor to be attached to cotton dryers.

Leaving Graniteville about 5 o'clock, I made close connection at Lowell and reached Boston about 6:30 p. m.

Hopedale Manufacturing Co.

Friday morning, February 1st, I left Boston on an early train for South Framingham, where I took a trolley car for Milford, Mass.

Reaching Milford about 9:30 o'clock, I took a short cut down the railroad track to the plant of the Hopedale Manufacturing Company.

I found Geo. Otis Draper in the office and in an exceedingly good humor, for he had just completed the sale of 500 looms to the Naumkeag Steam Cotton Company at Salem, Mass. As the Naumkeag Steam Cotton Company is among the top-notchers in the cotton manufacturing world and make what is probably the best piece of wide sheeting on the market, Mr. Draper was very much pleased that half of their new one thousand loom order went to his company.

I found the secretary, F. E. Norcross, in the office, and met the president, Jonas Northrop, as I went through the shops, but Clair H. Draper, the treasurer, was away.

Geo. Otis Draper is vice-president and general manager and is a brother of Arthur J. Draper, of Charlotte.

The Hopedale Manufacturing Company began in 1912 as manufacturers of stop motions, temples and loom batteries, and it was not until 1919 that they began to manufacture looms. They began with $10,000 capital and are now capitalized at $800,000.

They have an exceedingly well equipped shop and during the past year have built a modern foundry. They do not use many machine drawn moulds, as they claim that with highly skilled moulders they get better work from hand moulds.

An unusual feature of their foundry is that the entire floor is of cement covered with a thin layer of sand.

In the rattler room, the place where the rough castings are cleaned and trimmed, was one negro, and I was informed that he was the only negro that lived in Hopedale or any nearby town.

The Hopedale Manufacturing Company do most of their painting by dipping in vats, and they have a special process of grinding their crank shafts to exact size.

They make the shuttle eyes for the shuttles used in their looms but the shuttles are not made by them.

They do make the temple and temple rolls and I spent much time watching the machine that sets the pins in the temples. It was a wonderful machine.

The Hopedale Manufacturing Company is very proud of its loom feeler and state that they sell many for application to other looms.

Their machine shop is exceedingly well equipped and they plane or mill every joint so as to obtain the closest possible fit.

A very large room is devoted exclusively to the fitting and erection of looms and a wide variety of widths was shown.

They had recently completed a large order for the Erwin Mills at Duke and were working on 800 looms for the Hannah Pickett Mills, 400 for the Leak Manufacturing Company and 300 for the Balfour Mills near Hendersonville, N. C.

Their present capacity is about 6,000 looms per year.

A new feature of their loom is a shipping handle that is horizontal instead of vertical. They claim that when a weaver reaches for the shipping handle the palm of his hand is down and that he should not be required to turn his hand at right angles to the natural position in order to grasp the handle.

The last room I visited was that devoted to manufacturing drop wires which is a process requiring special machines and very expert help. They have manufactured drop wires since the business began and do a large business in addition to sale of drop wires with their looms.

I was particularly impressed with the growth of the Hopedale Manufacturing Company since a visit to them about three years ago.

Leaving Milford about 11:30 o'clock, I took lunch at South Framingham and reached Boston early in the afternoon.

(Continued next week)

American Power Co. Opens Charlotte Office.

The American Blower Company, of Detroit, Mich., has opened a branch office in Charlotte, with J. P. Kidd in charge. Mr. Kidd will work under the Atlanta office and will cover North Carolina and South Carolina.

The American Blower Company manufactures fans for the transfer of cotton and has also recently developed a very efficient system of cotton mill heating.

Sources of Cotton Supply

THE depredations of the boll weevil in the cotton belt of the United States has raised a general alarm throughout the textile world. The unfortunate part of the whole matter seems to be the apparent present inability of the rest of the world to make up for this American loss in production.

As one solution of our domestic problem, it has been suggested that the cotton belt be extended. Virginia on the north of the present cotton belt line claims to be beyond the boll weevil habitation, and is turning to cotton production rather rapidly. While this state up to the present time has been growing a little fringe of cotton along its southern border, George W. Keiner, State Commissioner of Agriculture, predicts that next year the fields of Virginia will be white with cotton. The staple has been grown successfully as far north as Richmond, one farmer in that section producing fifty bales on fifty acres last year.

The cost of cotton production in the United States today, however, is so prohibitive that the rest of the world cannot afford to pay for it. There are hundreds of places in India and in Brazil where the cost of the whole process of cotton production does not begin to approach the expense for fertilizer and calcium alone which has to be allowed annually in the United States. On a recent tour through the United States which Arno S. Pearse recently undertook, he says he heard many a cotton farmer, merchant and manufacturer acknowledge that America as "an economic cotton producer" is played out, and the sooner this fact is realized, the better it will be.

Because of this feeling, which seems to be prevalent throughout the textile world, cotton users are beginning to turn their attention to the development of cotton fields in new lands. European nations are looking to their colonies and dependencies to fill the wants created by America's failure to "produce the goods."

England's attempts to develop the cotton growing industry in Egypt have, for the most part, been rather unsuccessful. In the Sudan, however, the prospects are much brighter. It is maintained that if some arrangement could be made with Abyssinia to exploit fully the irrigation of the Blue Nile, some five million acres of the finest cotton growing land in the world would be capable of immediate development. Uganda is making notable progress in this industry, and the possibilities in Nigeria also appear great. Nyasaland, another small country under British dominion, is beginning to present very promising prospects. The development of cotton raising in South Africa presents difficulties too numerous to warrant definite action at the present time. In India, cotton production is increasing steadily each year, but progress is very slow and not much help is looked for in this region for the immediate crisis. The British West Indies is now producing annually about 4,500 bales of the famous Sea Island cotton, but this staple can be used only for a luxury trade in the finest variety of cotton goods.

In the Belgian Congo the annual output has increased from six bales in 1916, to 4,000 bales in 1922. Because of the peculiar climatic condition in this region, it is possible to grow cotton here throughout the year. In the north, efforts are being made to increase the annual output of raw cotton.

In the Dutch East Indies, Sea Island strains of cotton flourished for a year or two, but no permanent results followed, although the Dutch have been experimenting in this region for almost a century. They are now devoting their attention for the most part to the growing of cotton seed, and produce annually at Palembang in Sumatra from 4,000 to 6,000 tons of seed.

The principal colonies which supply France's raw cotton are: Algeria, Madagascar, French West Africa, New Hebrides, New Caledonia, and Tahiti. The Association Cotonniere Coloniale, a French Colonial cotton organization, has been at work since 1904, and it is claimed that 20,000 bales are annually grown under its auspices.

In regard to Italy's efforts along this line, the Duke of Abruzzi, a cousin of the King of Italy, went to Benadir shortly after the European War to study the possibility of an intensive cultivation of that country. As a result of his activity, great drainage works are now nearing completion. It is expected that when the task is done extensive tracts of irrigated lands will be available for cotton planting. The success of the Duke in this enterprise he lays to the system of co-operation which he has established with the natives, who have immediately recognized the advantage they can draw from this new method of cultivating their land.

Japan, just at present, is making a systematic effort to render her cotton industry entirely independent of outside resources. The program involves annual increases in the cotton area of Korea, and it is confidently expected that by 1928 at least 250,000 acres of American cotton and 85,000 acres of native cotton will be under cultivation.

In 1914 Russia (then including Poland) imported less than 600,000 bales of cotton for her nine and one-quarter million spindles, and provided from her own cotton fields approximately 1,500,000 bales. After the Revolution, her cotton production fell off rapidly, and in 1922 she produced only a little over 500,000 bales. The restoration of the irrigation works will soon be taken in hand, and keeping in mind her former production, the Russians possibilities seem very great.

In South and Central America cotton production looks most promising. Argentina produces annually nearly 700,000 bales; Ecuador provides a yearly total of 15,000 bales, while Peru, which is free from the boll weevil, raises close to 180,000 bales per annum.

The reign of cotton as "king" in the South seems to be drawing to a close. America cannot hope to compete successfully against the much cheaper costs of cotton production in other countries. Undoubtedly the extermination of the cotton pests in the South will appreciably reduce American costs, but even then, the low cost of labor in other lands seems to be a handicap as far as the world market is concerned, which America can never overcome. At present, the textile industry looks for the most part to America for her supply of raw cotton

Practical Discussions By Practical Men

Speed of Shafting.

Editor:

I would like some of your readers to tell me how to figure the following:

If a driving shaft that is making 400 r. p. m. carries a 26-inch pulley that is driving a 14-inch pulley on the main shaft, what is the speed of the main shaft?

Section Man.

Weight of Sliver.

Editor:

An answer to the following would be appreciated:

A mill requires 10,000 pounds of drawing every 10 hours. The allowance for stoppage and wasteis 3%. In the second process there are 19 frames having 6 deliveries each. The front rolls, which are metallic, make 350 r. p. m. What should the weight of the sliver be?

Beginner.

Question on Weaving.

Editor:

I would like to see the following answered on your Discussion Page:

What is the weight of warp and filling in one yard of cloth that contains 1,600 ends of 23s and 40 picks 26s, 39½ inches wide at the reed? If it is reeded 2 ends per dent, what number of reed will be used? How many yards per pound?

Fixer.

Managing Help.

Editor:

Just recently I saw an unusually good overseer "get through" on a mighty good job. I happened to know that this man is one of the best spinners in the South and that he can produce quality yarns without running his costs too high. He knows the spinning room thoroughly, but he lost his last job simply because he could not get along with too much inclined to spend our time his help. Sometimes I think we are altogether in machinery operation and neglect a very important phase of our work, namely, the human element. No matter how good your help is, the whole operation of a room, or mill, can be quickly ruined if the man in charge does not know how to get along with his people.

All the help in the mill are human beings and a word of help from the overseer at times does them a lot of good. Make them feel that you appreciate their work and they will do all they can for you. Some overseers say they are good managers of help and I venture to say that some of them are, but that overseer you will find is in a mill that is paying good wages to their help. Take that same overseer or manager and put him in a mill that is using low paid help and he will not be any good at all. Low paid help doesn't care anything about their jobs for the reason that they know there are plenty just as good or better somewhere else.

If the overseers of the South would devote a little more time to the proper training of their own help and not so much trying to rob their fellow overseers of what they have there would be a better and more contented class of skillful help in the South today than there is.

L. B. K.

Spinning Rolls.

Editor:

I recently saw some discussion about oiling top rolls in your paper. This brings up the whole question of rolls and of general care of the spinning frame.

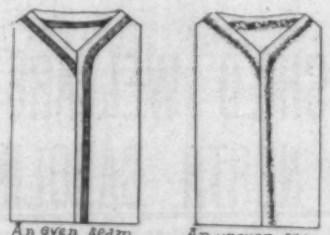
Leather rolls are very often the cause of much uneven work. A bad leather roll will cause uneven roving because the roll does the drawing out of the fibers and it is false economy to use cheap stock in roll covering. Rolls should be all spaced alike, for if one speeder is set closer than another, it will cause a much heavier hank roving. As to spinning it is a continuation of drawing and much can be done and left undone that will result in bad and uneven yarn. Rolls improperly spaced, or rolls not all spaced alike on the same counts, spaced too close will cause knotty yarn. Too wide will cause thin and thick places. Rolls should be cleaned and oiled periodically as anything that causes the roll to dwell will cause uneven yarn. A bad leather roll will cause lots of uneven work and should never be allowed to run if grooved or worn. Use plenty of rolls covered with the best material to be had and this alone will prevent lots of uneven yarn. All lint and fly should be kept if possible off the yarn, as it causes thick places, which is uneven yarn. For this reason the ceiling motors and shafting should be cleaned at noontime. The sides shouldn't run too long before brushing nor the sweeper allowed to knock under and drag out from under more than three frames.

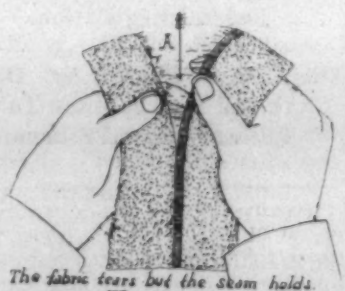
Spinner.

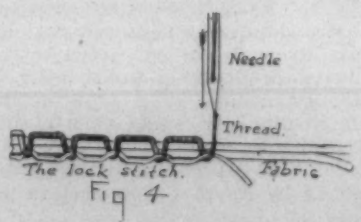
Finishing Knit Goods

THE seam is an important factor in the finishing operations of knit goods. The seam has to be made with several objects in view, such as strength, smoothness, flatness, elasticity to conform with the elasticity of the seamed texture, adjusted so that it will not rip or ravel and at the same time be attractive. The two abutted edges of the fabric which have been evenly cut for the purpose must be joined so that the seam will be practically without ridge or welt. It must be a comfortable seam, otherwise the buyers of the goods will complain. Customers will reject a seamed knit garment in which the bulky edges can be seen, for they realize that such a garment will not be comfortable to wear.

Several processes of seaming of cut underwear are used, the principles of which are the flatlocking system, the overlocking and felling system and the seaming and seam covering system. Sometimes the overlocking plan is used without the felling in order to curtail the cost of seaming. The overlock stitch is made with a double-thread over chain movement on a machine provided with knives to cut the edges of the fabric at the required distance from the seaming line. In order to avert the right angle pull or the left angle pull on the seam the process of felling is employed which involves sewing down the seam to one side of the joint. In the make-up of outer garments provisions are made to cover the seams on the interlocking looper which trims and joins the fabric, after which the seam is covered on a seam-covering machine provided with two needles and a thread-carrying looper. A pressing attachment flattens the edges while the work is going on so that a smooth, even surface results.







In the flatlocking system of seaming knitted fabrics the material is trimmed so that it can be fed to the stitching point edge to edge. A series of rows of interlocked chain stitches are produced in such way that the loops of the outer row join with the loops of the inner row so that the edges of the fabric are automatically drawn together and stitched very firmly and remarkably flat as compared with a process which makes an uneven seam. Hand-seaming was universally practiced years ago, and is now in some places, sometimes resulting in faulty seaming. In some mills the joining is done from the back, the edge loops being taken up one by one with a common sewing needle and joined with an ordinary stitch. This is slow work, but most of the bulk of the seaming thread will be on the back of the goods, leaving the face smooth.

Inspection of Seaming.

Regardless of the care used in either hand or machine seaming, it not infrequently happens that certain edge stitches are missed, causing a defect in the goods. If not detected in the inspection room and corrected by the menders, the article will have to be classed as a second. For this reason, even in mills where machine seaming is used exclusively, a hand-seamer is employed to mend imperfections of this character.

In some cases the stitching in the seams is made with too much tension on the thread, so that when the garment is subjected to a strain in the subsequent operations of finishing, the taut thread will break at a weak point and let the seam open. Or if a thread is used containing an element to cause it to shrink in a fabric which will not shrink in the finishing processes, such thread is likely to tighten to the point of breaking and cause an opening in the seam.

Hence the importance of careful inspection of seams. Some seams will be smooth and even as shown in the garment in Figure 1, while others may be as uneven as shown in the garment in Figure 2 A smooth, attractive seam will help sell the garment, while a poorly constructed seam is liable to have the opposite effect even if the goods are superior in structure and design. For this reason seam testing is more thoroughly conducted now than in former days. The examination of the seams is not only to assure attractiveness, but durability. The person who inspects the seams takes the seamed portion of the article between the thumb and forefinger of each hand, as shown in Figure 3, and stretches it. What is regarded as a strong seam is one which will not itself disintergrate under a tension, but will cause the fabric itself to rip as indicated by the arrow A.

(Continued on Page 30)

(Reprint from Greensboro Daily News.)

DAVID CLARK OF CHARLOTTE HITS THE CHILD LABOR PROPAGANDISTS

Tells Committee Hirelings Have Combed North Carolina For Dark Spots and Made Them Blacker—More Children In Penal Institutions Than Are In the Mills.

Daily News Bureau and Telegraph Office, 623 Albee Building (By Leased Wire)

Washington, March 7. — David Clark, editor of the Textile Journal of Charlotte, was a star witness today at the hearing before the judiciary committee of the house on the child labor amendment.

He opposed the amendment and took the position that it would not only interfere with the rights of the states and that the states could more efficiently and economically enforce their own child labor law than could the federal government. He said all the 48 states now had child labor laws and to enact a federal law was superfluous and unnecessary. He said it would cost the federal government an additional $1,000,000 appropriation for the children's bureau and result only in creating more federal jobs.

Mr. Clark then made the startling statement, backed up by the Cook County Manufacturing Association, of Chicago, that there were more children confined in penal institutions for delinquency of one kind or another than are employed in factories or mills. He offered the report of the secretary of the Cook County Manufacturers' association as a part of the record for the committee, but the committee reserved the right to accept the report as evidence.

Inspired, Paid Propaganda.

Clark asserted that the whole country had been flooded with propaganda for the amendment and 31 prominent journals had been paid to publish this propaganda, making it a leading feature and purposely distorting the facts. In this connection hired writers had been sent to North Carolina, now one of the leading textile states of the union, to search out and paint blacker every dark spot in child labor conditions.

Mr. Clark affirmed that practically no children under 14 years of age were employed in the textile mills of the south and especially in North Carolina, contrary to the erroneous reports of hired newspaper men who were paid to find and exaggerate conditions.

Last year, it was stated, only 4,691 children from 14 to 16 years of age were employed in the North Carolina textile mills. Over 7,000 were employed in 1920. In three years there was a decrease of 35 per cent. Only 61 children under 14 years of age were found violating the law in 2,000 investigations covering every cotton, hosiery and tobacco plant in the state.

More In Prison Than Mills.

Mr. Clark made the charge that the commerce department had represented the number of children working by number of certificates issued and not by the number actually employed. He contended that it was evident that a great many issued certificates had never been used, consequently the census of actual numbers employed was "grossly erroneous."

(Reprint from Charlotte Observer.)

CHILD WELFARE IN NORTH CAROLINA

Experts Appear in Opposition to Federal Legislation.

This State Shown by David Clark and Mrs. Johnson To Be Taking Care of Problem.

BY H. E. C. BRYANT.

WASHINGTON, March 7.—David Clark, editor of The Southern Textile Bulletin, and Mrs. Clarence Johnson, commissioner of public welfare of North Carolina, appeared before the house judiciary committee today.

Mrs. Johnson announced that she was there to correct untrue statements concerning child labor in North Carolina. The objectionable statements, she said, were exactly opposite to those made by certain federal investigators when questioned by North Carolina state authorities.

David Clark gave the attitude of the manufacturers. He said they were opposed to child labor in any form, but just as stoutly opposed to any sort of federal interferences.

David Clark stated that it had been proven by figures of E. F. Carter, executive secretary of the North Carolina state child welfare commission, that the condition of the children was far better than it had been shown before. A decrease of 30 per cent had been shown during the past three years.

David Clark charged the commerce department with not caring for the condition of the children

after they were removed from work, showing that states of the south did not have such measures. He also showed by figures that there was more child delinquency than there was of child labor. One-sixth of the delinquency cases of the country were in the three states that were so strongly attacking child labor in the south and are supporting the federal amendment.

David Clark was bitterly attacked by some of the representatives of the northern states for his position in the matter.

He emphasized that he strongly favored state legislation against child labor but was opposed to a federal enactment which gave Congress the power to dictate how matters should be run that were purely state problems, emphasizing how North Carolina, through the education and welfare departments, was caring for her children.

(Reprint from New York World.)

EDITOR OF TEXTILE PAPER ADVOCATES LABOR BY CHILDREN

Man Who Led Fight Against Law That Caused Its Defeat Savagely Attacks Bureau.

MORE YOUTH IN JAILS THAN FACTORIES, HE SAYS

North Carolina Welfare Head Admits Truth of Charges First Made by The World.

By HENRY F. PRINGLE
Staff Correspondent of The World

Special Despatch to The World

WASHINGTON, March 7.—In a savage attack on the Children's Bureau of the Department of Labor at a hearing of the House Judiciary Committee today, David Clark, editor of the Southern Textile Bulletin, declared many of the proponents of the Child Labor Amendment preferred sending children to "jail or hell" rather than to work.

Mr. Clark, who was the leader of the movement which brought the first Federal Child Labor Law to the Supreme Court and had the measure declared unconstitutional, said juvenile delinquency was a much more serious problem than child labor. He said the Children's Bureau had never taken into consideration that Federal regulation of the problem would not provide schools or occupations for the children taken from industry.

Quote Editor's Own Paper.

The Southern Textile Bulletin, owned as well as edited by Mr. Clark, is published in Charlotte, N. C. He declared he had never opposed State regulation of child labor, but under questioning by members of the committee admitted he had never appeared in favor of any bill which sought to improve the condition of the children in the mills of North Carolina. Representative Israel M. Foster (R., I.) then quoted from an editorial which appeared in the textile publication after the first Federal law had been upset.

This declared the textile interests had cause for rejoicing over the decision of the Supreme Court. Mr. Foster demanded to know whether Clark spoke as the representative of the textile mills, now working children eleven hours a day in North Carolina, or whether he actually opposed the amendment on the ground that it denied the right of the States to legislate on local matters.

"Why didn't you ask the children to celebrate with you?" asked Mr. Foster.

Welfare Head Testifies.

Mrs. Katherine Burr Johnson, head of the Child Welfare Commission of North Carolina, appeared at the hearing today. She admitted the charge, first published in The World that convicts are better protected in working hours than are the children of the State. She said she thought this should be rectified. Mrs. Johnson said the State had been greatly misrepresented by allegations that children under fourteen were at work in large numbers.

While Clark was on the stand he declared "more children were in jail than were at work." He was asked to substantiate this charge and attempted to read into the record quotations from several letters. This was not permitted, but the letters were held for reference by the committee.

Stocks Decline During the Week

Common stocks of the Southern cotton mills continued to decline during the past week, practically the entire list registering losses of from one to seven dollars per share, according to the weekly review of Southern mill shares prepared by R. S. Dickson & Co.

Anderson was down three points, as were Belton and Brogon, Clifton was down two points, Dunean one, Gaffney two, Judson three, Monarch one, Marlboro four, Orr one, Victor-Monaghan six and Woodside two.

The preferred shares were offered freely at slightly lower prices. Judson, Dunean, Woodside and Easley showed slight declines with limited buying orders for shares and only small lots changing hands.

Various issues of North Carolina common and preferred stocks also weakened and trading was confined principally to a few of the higher grade preferred stocks.

The average of 25 most active Southern mill shares shows the largest decline recorded in some time. At 124.64 for the past week the average is 8.20 below the previous week when the average stood at 132.82 and 7.06 below the low mark of 131.60 for the first week in January, 1923, the low mark for that year.

SOUTHERN
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Member of Audit Bureau of Circulations

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DAVID CLARK ..... Managing Editor
D. H. HILL, JR. ..... Associate Editor
JUNIUS M. SMITH ..... Business Manager

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The Danger Point

THE cotton manufacturing industry is complacently sitting on the edge of a volcano.

It is paying no attention to a situation that may at any moment bring disaster.

Its optimism in the midst of a supreme danger is indeed beautiful.

On August 1, 1921, the carry-over of American cotton was 9,200,000 bales and the size of the crop made little difference.

On August 1, 1922, there was a carry-over of 4,900,000 bales and still the size of the crop was not a serious matter.

On August 1, 1923, the carry-over of American cotton was 2,573,000 bales and the size of the crop became a matter of extreme importance. In spite of the present bearish atmosphere we predict that mills will be idle because of a lack of available cotton before the end of the season.

On August 1, 1924, the carry-over of American cotton will be from 1,000,000 to 1,500,000 bales and the size of the 1924 crop becomes a matter of extreme importance.

Should the 1924 crop be 13,000,000 bales, the mills will be comfortably supplied with cotton but there will be no surplus.

Should the 1924 crop be 12,000,000 bales we will be at this time next season with approximately the same supplies as today.

Should the 1924 crop be 11,000,000 bales there will be 1,000,000 bales less than today and there will be forced curtailment.

Should the 1924 crop be 10,000,000 bales the cotton mills using American cotton will be forced to curtail to the extent of 2,000,000 bales which will mean idleness for thousands of cotton mill operatives and a disaster upon the industry.

No thinking man can, in his imagination, stretch a 10,000,000 or a 11,000,000 bales crop to meet the needs of the world next year.

No one knows the size of the 1924 crop but the recent drive against prices has discouraged increased acreage and a 5 per cent increase is now considered unlikely.

The question of the 1924 crop depends almost entirely upon the weather and the stability of the cotton manufacturing industry for the next year therefore rests upon weather and weather is uncertain.

Should rainy spells occur during March, April or May, or droughts during July and August, the 1924 prospects can be easily reduced to 10,000,000 and the sudden and certain realization of an absolute shortage of cotton confront the industry.

In our opinion cotton manufacturers are confronting a precarious situation and almost any day disaster may be upon them.

We are hoping for good weather and a reasonably large crop, but we do not hope with much optimism for the boll weevil is still with us.

Before cotton is planted and with no assurance of an adequate supply October cotton is selling around 25 cents, a price that would not be justified with a crop of less than 13,000,000 bales.

The fortunes of a great industry rest upon the weather. It is an unfortunate position filled with possibilities.

Before the Judiciary Committee

THAT was "some" hearing, before the House Judiciary Committee of Congress, last Friday.

It was supposed to be a tribunal seeking information relative to the merits of the proposed Federal Child Labor Constitutional Amendment but it reminded one of the lawyers in an Inferior Court, in fact, a very inferior court, trying to exclude all evidence that did not favor their side of the case.

Congressmen Foster and Perlman seem to have absolutely no idea of the position they occupied and spent their time trying to keep out any evidence that did not suit them and to discredit witnesses whose views differed with theirs.

The entire evidence will be published in the Southern Textile Bulletin as soon as it is released by the Judiciary Committee.

David Clark was ill in bed with ptomaine poison and was not in condition to go to Washington but went when the committee refused to grant a postponement.

He attended part of the hearing on Thursday morning and it was only by special treatment under Dr. Sterling Ruffin, of Washington, was he in condition to appear Friday, and then had to secure special permission to give his testimony while seated.

E. F. Carter, executive secretary of the North Carolina Child Welfare Committee, had on Thursday given the committee statistics relative to the employment of children in North Carolina showing that Miss Abbott's figures were gross misstatements of facts, and Mrs. K. B. Johnson, superintendent of Public Welfare for North Carolina, had testified relative to the North Carolina laws and their enforcement.

Mr. Clark endeavored to follow their testimony with statements from the welfare departments of other Southern States relative to the child labor laws and their enforcement, but upon the objections of Congressmen Foster, Perlman and others, he was not allowed to introduce the evidence.

The documents which Mr. Clark held would have disproved the statistics that had been put into the records by Miss Abbott and therefore Mr. Foster and his allies seemed to object to the disproving of the false statistics which were to be used in forcing the resolution through the House.

Document after document offered by Mr. Clark was refused admission to the records, although the same kind of documents on the other side had been freely introduced.

In an argument before the committee on Wednesday, Jas. A. Emery, attorney for the National Manufacturers' Association, charged that the Children's Bureau of the Department of Labor was now getting one million dollars a year from the Government and David Clark supplemented his statement with the assertion that all the people of the country were getting for the million dollars was an agitation for another million dollars which is the estimate of the cost of the enforcement of a Federal child labor law if enacted.

Mr. Clark read from the testimony of Miss Abbott a statement that she did not favor making the law apply to farm children and placed beside it a report by Miss Abbott describing the pitiful condition of farm children in North Dakota.

Calling attention to the prevalence of juvenile delinquency and its steady increase, Mr. Clark charged the Children's Bureau with doing nothing to aid delinquent children.

The Children's Bureau, said Mr. Clark to the committee, do not seem to care whether children go to jail or go to hell so long as they do not work.

When that statement was challenged he asserted that there were more children in jail in Illinois than are working in North Carolina and in proof of that fact attempted to read into the record a letter from the Assistant District Attorney at Chicago but the committee refused to allow the evidence to be put in the record. A copy of the letter is published on page 31 of this issue.

On page 24 will be found a reprint of an article that appeared in the New York World but it does not tell the truth, for Mr. Clark not only did not advocate child labor but stated emphatically that the cotton manufacturers of the South were opposed to child labor.

We hope to be able to publish the testimony in full next week.

Union Talk

ABOUT once per month during the past year the union organizers have gone into the press with the statement that the cotton mill operatives of the South are to be organized.

The American Federation of Labor at their last annual meeting promised (?) funds for the organization of Southern mills and the organizers are talking big in the hopes of getting their hands upon those funds.

The truth is that the cotton mill operatives, with the exception of a few socialists, will have nothing to do with the organizers.

The operatives in this section have not forgotten that they paid dues for two years under the promise of $6 per week when they struck and that the Thos. Failure McMahon gang kept all the money and left them to starve or depend upon charity during the Charlotte-Concord-Kannapolis strike.

This is no time to talk about unions or strikes.

The cotton mills are making great sacrifices and suffering large losses in order to keep their machinery going and give employment to their operatives.

If it were not for their loyalty to their operatives most mills would have stopped their machinery two months ago.

The organizer who enters a mill village under such circumstances well deserves a cold bath in the mill pond.

We can state, however, that they are having no success in organizing and that their newspaper stories are idle talk.

Two Important Meetings

Two very important meetings for Southern superintendents and overseers are to be held soon. The first is that of the Textile Operating Executives of Georgia, to be held in Atlanta on Tuesday, March 18. A large attendance of the Georgia mill men is expected. Full details of this meeting, including the questionnaire on carding and spinning, to which the meeting will be devoted, were published in these columns last week.

The Spinners' Division of the Southern Textile Association will meet in Greensboro, N. C., on April 18. An unusually interesting meeting is promised by those in charge of the program. Carl H. Harris, chairman of the Spinners' Division, will preside.

Personal News

James B. Platt has become superintendent of the Acworth Mills, Acworth, Ga.

Eugene Herring has accepted the position of superintendent of the McLin Textile Mills, Rome, Ga.

O. W. Whatley has resigned as superintendent of the McLin Textile Mills, Rome, Ga.

C. L. Upchurch has resigned as superintendent of the Whitehall Yarn Mills, Whitehall, Ga.

J. B. Williams has become superintendent of the Whitehall Yarn Mills, Whitehall, Ga.

E. W. Morris has resigned as overseer spinning at the Phenix Mills, Kings Mountain, N. C.

A. B. Cobb is now overseer spinning at the Phenix Mills, Kings Mountain, N. C.

S. C. Neal has resigned as overseer of the cloth room at the Phenix Mill, Kings Mountain, N. C.

A. B. Edwards has been promoted from overseer spinning to superintendent of the Calhoun Yarn Mills, Calhoun, Ga.

C. H. Lockman, of LaGrange, Ga., has accepted the position of overseer weaving at the Union-Buffalo Mills, Union, S. C.

G. C. Starr has resigned as overseer carding at the Cascade Mill, Gastonia, N. C., to accept a similar position at the Madora Mills, Mt. Holly, N. C.

H. F. Harrill, formerly overseer weaving at the Chadwick-Hoskins Mill No. 3, Charlotte, has accepted a similar position at the Cascade Mills, Mooresville, N. C.

J. D. Bailey, of the Draper Corporation, is erecting the 450 new looms now being installed at the Beaumont Manufacturing Company, Spartanburg, S. C.

W. W. Greer has resigned as overseer of weaving at the Ware Shoals Manufacturing Company, Ware Shoals, S. C., to accept a position as traveling representative for the Seydel Chemical Company. He will travel North and South Carolina.

John Campbell & Co. Open Southern Office.

John Campbell & Co., New York dyestuff manufacturers, have opened a Southern office at Salisbury, N. C., and will handle their Southern business from that point. The company already has a large trade with the Southern mills and their products are well and favorably known to dyestuff users.

The Southern office is in charge of L. M. Boyd, who has been with the company for some time.

B. J. Beardsley With Hazard Agency

Burdett J. Beardsley, one of the best known advertising men in this country, has been elected vice-president of the Hazard Advertising Corporation, of New York. In his new position, Mr. Beardsley will have direct supervision of all merchandising of this well known advertising agency.

Superintendents and Overseers

Linn Mill Co.
Landis, N. C.
9,812 spinning spindles.

G. O. Pike	Supt.
P. A. Caster	Carder
A. P. Setzer	Spinner
Geo. Wright	Master Mechanic

Aragon Cotton Mills.
Rock Hill, S. C.
23,552 spinning spindles; 566 looms.

Fred L. Still	Supt.
J. B. Horton	Carder
T. F. Starnes	Spinner
E. E. Dickert	Weaver
R. H. Byers	Cloth Room
N. V. Sanders	Cotton and Supply Clerk
M. C. Kirkpatrick	Master Mechanic
Harry Belk	Yard Foreman
L. L. Bowers	House Man

Griffin Manufacturing Co.
Griffin, Ga.
35,000 spinning spindles; 1,100 looms.

H. D. Martin	Supt.
James Oates	Carder
C. A. Huckaby	Spinner
V. J. Deas	Weaver
W. B. Cannon	Cloth Room
W. P. Bowden	Dyer
L. F. Jones, Sr.	Master Mechanic
R. H. Seymour	Dressing
C. H. Scales	Head of Order Dept.

Knoxville Cotton Mills.
Knoxville, Tenn.
30,228 spinning spindles; 2,160 cone wind spindles.

M. A. Storey	Supt.
J. E. Fields	Carder
J. L. Harper	Spinner
Sam Lane	Winder Room
Riley Moos	Master Mechanic

American Cotton Mill, Inc.
Bessemer City, N. C.
11,520 spinning spindles; 98 wide looms.

Wm. P. Cargill	Genl. Supt.
R. H. Rouse	Supt.
J. R. Puckett	Carder
Wm. McLoud	Spinner
C. E. Bryant	Weaver
B. C. Callis	Cloth Room
D. C. Harden	Master Mechanic

Spartan Mills.
Spartanburg, S. C.

W. J. Britton	Supt.
W. R. McGraw	Carder
J. T. Cothran	Spinner
Jas. R. Shippey	Weaver
Calvin Whitten	Cloth Room
J. M. Dye	Master Mechanic

MILL NEWS ITEMS OF INTEREST

Belton, S. C.—Blair Mills have placed contract with the Bahnson Company, Winston-Salem, N. C., for equipping their mill with Bahnson humidifiers.

New Orleans, La.—The report that the Maginnis Mills are to be sold, as published last week, is incorrect. The report referred to the Magnolia Mills, known locally as the Orleans Mills.

Greenville, S. C.—The Chamber of Commerce reports that a hosiery mill will likely be built here by a company that is now investigating possible sites for the proposed mill.

Huntsville, Ala.—It is reported that the Lincoln Mills of Alabama will erect a new mill here upon completion of the addition now under construction at their present plant.

Union Springs, Ala. — Avondale Mills, at Birmingham, Ala., have placed contract with the Bahnson Company, Winston-Salem, N. C., for humidifier equipment for their Cowikee Mills.

Greenville, S. C.—The Keowee Yarn Mill, of Walhalla, S. C., has been sold to W. K. Stringer, of Anderson.

The price paid was $30,200, and the sale must be confirmed by the courts. Mr. Stringer has not announced his future plans relative to the mill, which has been in court proceedings for some time.

Lexington, N. C.—Erlanger Cotton Mills has retained E. S. Draper, landscape architect and engineer, Charlotte, N. C., and Atlanta, Ga., to plan development or community grounds to include large swimming pool with pergola enclosure, bath houses, wading pool for children and community playground.

Dalton, Ga.—The erection of the new American Thread Company's new mill here is going forward rapidly, and it is reported that it will be in operation by next fall. The capacity of this plant will be about 15,000 spindles.

The village will consist of 132 new houses, which are to be built immediately, by the LaGrange (Ga.) Lumber and Supply Company.

Thomaston, Ga.—Julian T. Hightower and associates are having plans prepared for the erection of a bleachery here. The plant will finish the output of the Thomaston Mills and also handle work for other mills. The building will be 480x1000 feet, one and two stories high and the gray room and warehouse will have a floor space of 60,000 square feet. It will be equipped for a weekly production of 500,000 yards, the equipment to include sewing machines to make up sheets. Robert & Co., Atlanta, are the engineers.

Barnesville, Ga.—The Carter-Collier Company, which recently doubled the capacity of its knitting mill, will erect ten new cottages in its village.

Hudson, N. C.—Rufus Gywn, president of the Caldwell Cotton Mills, has retired from active management of the company on account of poor health and the mill will hereafter be under the same management as the mills of the Nelson group at Lenoir. The transfer in management was effected at a stockholders' meeting, at which the following officers were elected: T. R. Broyhill, president; J. C. Seagle, vice-president; J. L. Nelson, secretary and treasurer; J. L. Nelson, Jr., assistant treasurer.

Rockingham, N. C.—The Hannah-Pickett Mills have filed an amendment to their charter which increases their capital stock from $200,000 to $1,000,000. There are now 5,000 shares of cumulative preferred stock of par value $100 per share and 5,000 shares of common stock.

Charlotte, N. C.—The Brown-Phelps Hosiery Company, 21st and Lippincott streets, Philadelphia, are contemplating moving their hosiery plant to the South. An official of this company was recently in Charlotte looking into the matter of moving the plant to this section. The mill has more than 500 knitting machines and employs about 150 persons.

Balfour, N. C.—Balfour Mills have awarded contract to General Electric Company for motors, transformers, and switchboard; to Link Belt Company for chain drives, and to Bahnson Company for humidifying equipment.

Construction work on the mill is progressing rapidly. About forty village houses have been completed and the foundation of main mill is in. J. E. Sirrine & Co., Greenville, S. C., are the engineers.

Whitmire, S. C.—At the annual meeting of the Glenn-Lowry Manufacturing Company, stockholders were informed that conditions seem improving and the company has not found it necessary to curtail production.

The directors re-elected A. T. Quantz, president, and L. E. Beard, secretary and treasurer, for another year. George M. Wright, R. E. Henry, J. P. Stevens, Nathaniel Stevens, W. J. Gallon, L. E. Beard, A. T. Quantz, J. E. McDonald and C. M. Bailey compose the board of directors.

Charlotte, N. C.—It is reported upon what appears to be very reliable authority that the Thrift Manufacturing Company, located at Paw Creek, N. C., has been sold to H. P. Kendall, of Boston, who now operates mills at Camden, S. C., and Edgefield, S. C. The Thrift Manufacturing Company is one of the best equipped and most efficient cotton mills in the South. It has 26,208 spindles and 594 looms, which have been operated on wide convertibles. W. C. Wilkinson, of Charlotte, N. C., has been president. It is understood that the transfer will take place April 1.

Spartanburg Mill Operations.

Spartanburg, S. C.—The cotton mills of this county continue to operate full time, with several working night shifts. The Chesnee Cotton Mill, working on some fine yarn goods, is working a night shift and has been doing so for some time. The Martel plant at Valley Falls, producing sheetings and narrow drills, has been working at night force for a long time.

Columbus Mills Running Full Time.

Columbus, Ga.—The cotton manufacturing establishments of Columbus and vicinity are running full time, with the exception of the Swift Manufacturing Company, which recently has been going only about four days a week due to repairs and enlargements understood to be under way. In connection with the expansions to be provided at this plant a brick warehouse 74x74 feet is now being erected to be used for cotton cleaning purposes.

The Bibb Mills, the Muscogee Mills and the Eagle & Phenix Mills

are reported as operating some departments overtime, affording night work for several hundred employees in addition to their regular day forces.

The local mills report an ample supply of cotton on hand, and orders. A spirit of optimism generally prevails in the industry here, and no shutdowns or curtailment of output are in sight for any cause, according to men who have been engaged in the industry here for many years.

South Carolina Curtailment.

Greenville, S. C.—While mills over the Piedmont section are continuing to curtail operations, no curtailment is evident in Greenville.

Mills in Clinton, Union, Anderson, Williamston and Calhoun Falls have announced curtailed schedules. Executives of local mills continue to say curtailment may become necessary, but are unable to say when such a schedule will be put into effect, if at all.

Macon Mill Situation.

Macon, Ga.—Four cotton mills made slight increases this week in the number of persons employed. Of nine mills here, seven are running full time and two are running overtime.

No reductions of force is being made and none is looked for in the immediate future. The number of persons employed in industrial establishments here has been increasing each month since January, 1923. This is shown by reports received by the Chamber of Commerce from 165 factories in the Macon district.

Textile mills have advance orders for over 3,000 additional horsepower as soon as available.

Manchester Mill Trouble Settled.

Manchester, Eng., March 11.—Work resumed today at the Thornham Cotton Mill, near Royton, where a strike had threatened to result in a lockout of some 150,000 operatives by the Cotton Spinners' Federation. Following the action of the Carding Room Amalgation which yesterday withdrew from the dispute the employers today authorized the withdrawal of all the lockout notices that had been given and work will continue on normal lines throughout the industry. The dispute arose through the introduction into the Thornhame Mill of an extra machine, imposing increased work.

Textile Club Plans Acquaintance Tour

Greenville, S. C.—What is declared to be the first annual "Textile Acquaintance Tour" ever attempted in the United States is being planned here by officials of the Greenville Textile Club, following a meeting held last week at the Union Bleachery in this city.

According to Prof. C. W. McSwain, textile instructor of the Parker school district, and C. B. Dill, president of the Greenville Textile Club, there is strong probability of the project going through. Mr. Dill was instructed to appoint a committee to further consider the proposed trip. Should the trip be made this year, it is proposed to make it an annual event.

Plans, as yet in the making, call for a special train to carry one hundred or more superintendents, overseers and other employes of the Greenville mills. The route to be taken would be through Georgia, North Carolina and Virginia, visiting the larger textile centers of those States. The exchange of ideas would be the principal object of the visit and would, it is believed, bring much benefit to those making the trip.

Professor McSwain expressed the opinion that no similar tour has ever been undertaken by any city in the United States and thinks much advertising would also come to Greenville, "The Textile Center of the South," by reason of the trip. Officials of all Greenville mills are expected to co-operate in making the trip a reality, should the committee decide definitely to undertake it.

New England-Southern Mills Operating Profit Is $212,890

Boston.—The New England-Southern Mills, composed of the old International Cotton Mills properties and the newly acquired Lockwood, Greene properties in the South, report a net operating profit for the year ended December 31, 1923, of $212,890, after all interest charges, taxes and depreciation. The following income account shows the effect of the Tucapau Mills and one month's operation of the Pelzer Manufacturing Company:

Gross sales, $12,280,776; selling expenses, $779,633; income from sales, $11,501,143; cost of goods sold, $10,537,919; reserves and taxes, $51,721; depreciation and interest, $630,468; operating profit, $281,034; profit accrued on minority stock not owned by the company, $68,144; not operating profit, $212,890.

President S. Harold Greene told stockholders that the new mill in Georgia has been completed and the tire fabric machinery from Lowell, Le Roy and New Buryport plants installed in this building, where, under Southern conditions, tire fabric can be made to better advantage than in the North. The plant at Lowell is being converted from tire fabric to wide sheeting, he said, and this, it is believed, will put that mill on a profitable operation.

It was announced that Nathaniel F. Ayer, of Boston, George McFadden, of Philadelphia, and Victor M. Montgomery and Robert B. Barnwell, of Spartanburg, S. C., have been elected directors.

Wanted

To buy a used, 100 lb. dyestuff mixing machine. State price and particulars. Address L. M. B., care Southern Textile Bulletin.

Finishing Knit Goods

(Continued from Page 23)

That is, the pressure exerted on the seam does not disrupt the seam but tears the fabric. This indicates that the seam is stronger than the body portion of the garment and will stand common usage. But if the seam itself becomes broken when put to the stretching test, it proves that the seam is not properly made.

Pprinciple of the Lock-Stitch in Seaming Knitted Goods.

The principle of the lock-stitch commonly used in seaming knitted fabrics is shown in the sectional illustration of a seam in Figure 4. There are two separate threads used in making this type of stitch, one of which is carried by a needle and the other by a shuttle.

The stitch is made by forming a loop with the needle thread on the back of the seam so that the shuttle thread can pass through. The slack of the loop is automatically taken up as soon as the shuttle had delivered its thread in it and a stitch is made.

The needle thread is the one which is shown in the needle and the shuttle thread the one which is on the underside of the seam. The evolutions of each thread can be followed in the diagram. In case that double stitching is required for strong seams, two sets of needles are used and the shuttle passes through the loops made by both, resulting in two rows of stitches each a short distance apart. In fact, there are machines in use provided with means for operating two, three or four needles for the production of multiple rows of parallel stitches at a single operation. Others are arranged for inserting embroidering threads when it is desired to ornament the seams.

Seaming Wrought Underwear.

The point and cup seaming machines are commonly employed in seaming wrought underwear, whereby the edges are united loop to loop. The principle of point seaming is similar to link seaming. The loops of one edge of the fabric are evenly joined to the loops of the other edge.

In the cup seaming machines the edges of the fabric are passed between two intermittently racked cups facilitating the insertion of a double chain overstitch which makes a good seam for wrought underwear. Owing to the higher speed at which the cup seaming machines can be operated they are preferred to the point seaming machines, unless the character of the fabric requires that the point seaming system be employed. In some lines of knitted fabrics it is essential that the stitches in the seams be very elastic. In other kinds the matter of stitch elasticity is not of vital importance. The manufacturer of knitted under and outerwear has all such points to consider in order to produce perfect goods at the least cost of operation. For instance, point seaming is considered an ideal method of seaming most wrought knitted fabrics, but it is slow and expensive as compared to the speed and expense of operation of the cup seaming method.

Modern cup seaming machines, operating at a speed of over 3,000 stitches per minute, have enabled the wrought underwear manufacturers to seam wrought goods as speedily as cut goods.

Textile Night Schools Double Last Year's Attendance

Greenville, S. C.—More than 2,000 men are enrolled in the textile night classes of the State during the present school year, according to H. B. Adams, State supervisor of industrial education.

This number is approximately twice as large as the number enrolled during the year 1922-1923, Mr. Adams declared. The men are divided into 143 classes in the cotton mill villages of the State, the majority of them being in the Pied-

mont section, surrounding Greenville.

Classes are held regularly at night, teachers of the public schools volunteering their services in this work. Reading, writing, arithmetic, civics and other subjects are taught in addition to studies which equip the student for obtaining a higher position in textile work.

Greenville mills lead the State in this respect, successful classes being operated at virtually all the mill villages which surround this city. Students who have enrolled during past years are again pursuing their studies and declare they have derived much benefit from this institution.

The work will be continued, it was stated, results over the State showing that it has passed the experimental stage and enlarged plans are being made now for next year.

Citing a particular instance of what is being done in this respect, Mr. Adams highly praised the class work at Abbeville Cotton Mills at Abbeville.

Twenty-nine students, as many as can be handled by one teacher, are enrolled in the class at Abbeville, which is taught by Miss M. P. Jones. A large number of persons are on the "waiting list" of the class, being anxious to take up the work.

The mill authorities are said to have co-operated with the State Department of Education, allowing some of the men to attend during work hours by making arrangements to have all the jobs carried on with spare help. All subjects taught bear on the textile industry, and mill officials have stated, Mr. Adams said, that the efficiency of their help has been increased by the classes.

Juvenile Crime in Illinois

ILLINOIS MANUFACTURERS' ASSOCIATION

Chicago, March 5, 1924.

Mr. David Clark,
Raleigh Hotel,
Washington, D. C.

Dear Sir:

Following the letter we dictated early in the day, in relation to the increased delinquency among juveniles, Louis N. Bloomenthal, an assistant in the States Attorney's office of Cook County, expresses the belief that juvenile delinquency is increasing in Chicago largely because of the lack of suitable employment for boys between 17 and 21 years of age.

"In 1923," said Mr. Bloomenthal, "there were 115,000 boys in Chicago boy out of every 16. Two-thirds of them were discharged, one-twelfth were released on probation and one-fifth of the number that were tried were convicted and punished. Boys of that age, having nothing to do, and being fond of amusement such as theatre going, readily engage in burglary, hold-ups and the more serious crimes including robberies with guns. A great majority of the prisoners sent to the State Penitentiary are under 25 years of age and this is primarily due to their social status. There is more loafing than between 17 and 21. Of this number 7,234 were tried for crimes, or one formerly. When a boy is at work he does not have time to think of crime. In the cases which came under my personal supervision, I was unable to find any boys with a record of two years regular employment."

The number of delinquent cases received at the Juvenile Detention Home of Chicago for the last three years was as follows:

	1921	1922	1923
Boys	2796	2753	3191
Girls	921	947	769

I was unable to obtain figures previous to 1921.

The statistics of delinquent children brought into the juvenile court between 1916 and 1923 show a decrease in the latter year but this does not signify anything except that the present policy is not to bring into court so many children as formerly. The real measure of increase in delinquency is probably indicated by the number of children received at the juvenile home. The total delinquent children brought into the juvenile court in 1916 amounted to 2786, or 2192 boys and 594 girls. By 1919 this had jumped to 3402, or 2647 boys and 755 girls. About that time the policy of the juvenile court officers was changed and they did not take children into court for the minor offenses, so by 1923 the delinquent children brought into the juvenile court had decreased to 1774 or 1237 boys and 537 girls. A good many delinquent boys and girls are taken to the home without being brought into court, which would account for the larger number at the home.

Burglary cases against boys in which final orders were entered in the juvenile court from 1916 to 1922, inclusive, are as follows:

1916	1917	1918	1919	1920	1921	1922
320	307	377	388	312	329	386

The ages of children brought into the juvenile court of Cook County between 1921 and 1922 show that in the ages between 14 and 16, the criminal tendencies are most pronounced.

Under the Illinois law, minors under the age of 14 are not permitted to work in any gainful occupation. Over the age of 14 years and under the age of 16 years it is necessary for employers to have an employment certificate for each minor. Certain hazardous employments are forbidden all minors under 16 years of age. The law relating to part time or continuation schools provides that minors between 14 and 17 years of age must attend such continuation schools not less than eight hours per week for at least 36 weeks each year or 300 hours if such attendance is confined to a period of three consecutive months. In most districts of the State, including Chicago, there are not enough continuation schools to take care of students over 16 years of age so the 17-year limit has not been strictly enforced. Beginning September 1, 1925, the continuation school law applies to minors between 14 and 18 years of age.

Very truly yours,
(Signed) John M. Glenn,
Secretary.

Revise Yarn and Thread Standards

Washington.—Revision of present tentative standards for tolerances and test methods for cotton yarns, proposed tentative specifications for tolerances and test methods for electrical cotton yarns, and proposed tentative specifications for tolerances and test methods for cotton sewing threads were discussed at the regular March meeting of the American Society for Testing Materials, held at the Bureau of Standards in Washington.

F. R. McGowan, of the textile division, Bureau of Standards, welcomed the members of the society when the meeting was called to order by A. E. Jury, chairman of the committee on textile materials. Mr. McGowan briefly outlined some of the work the bureau now has under way.

Tests now being conducted, Mr. McGowan said, show the value of twists for tensile strength and dyeing, a study looking toward the standardization of mercerized yarns, and a study of dyes and dyeing along with methods for the standardization of underwear sizes, and on the strength of cordage.

Mr. McGowan said that there had just been discovered by the bureau a method of purifying gasoline at a cost of about 1 cent per gallon, which meant a tremendous saving to dyeing and cleaning establishments.

In calling the convention to order, Mr. Jury urged that the members of the society proceed with all haste so that the various reports submitted by sub-committees could be fully discussed and made ready for final presentation and adoption at the next annual meeting.

The first report taken up was submitted by sub-committee No. 7, on yarn, thread and twine, by K. B. Cook, of the United States Rubber Company. The report varied considerably with that tentatively adopted by the society and issued in 1923. The main changes, Mr. Cook explained, were in that section of the report covering tolerances. Under the revised tolerance specifications, purchasers of yarns would be delivered within 2 per cent of the specified numbers of yarns within a case.

This statement led to violent discussion between members of the society, and it was strongly contended that it would be impossible to deliver yarns within 2 per cent of the specified numbers. The specifications proposed by Mr. Cook on this particular subject provided that "the average size of each case, bale, chain ball or beam warp of yarn, either single or plied, as found by tests shall not vary from the specified size beyond the following tolerances:"

Yarn range, singles or equivalent, up to 17s, tolerances carded, 4 per cent above, 2 per cent below; combed, 2 per cent above, 2 per cent below; 17s to 40s tolerances carded, 3 per cent above, 2 per cent below; combed, 2 per cent above, 2 per cent below; 40s and above tolerances carded, 2 per cent above, 2 per cent below; combed, 2 per cent above, 2 per cent below; example: No. 36, carded yarn specified, tolerance would allow 35.28 to 37.08.

It was finally agreed after the matter had been discussed pro and con that this particular specification should be changed to read:

"The average size of each case, bale, chain ball, beam warp of yarn in singles as found by tests, etc., should not vary from the specified size beyond the following tolerances:

"Yarn range, singles up to 17s and above, tolerances for both carded and combed should be 3 per cent above and 3 per cent below."

It was further agreed that these revised specifications would be submitted at the annual meeting of the society. Specifications on this particular point adopted in 1923 provided that the tolerances should be 7 per cent, both over and under. These figures, the discussion developed, were radically wrong, and it was unanimously agreed that they should be amended, but delegates present were not sure as to what percentages could be applied that would be satisfactory to both consumer and manufacturer.

Mr. Jury said that there had always been a tendency on the part of the manufacturer to hold off the adoption of specifications until they were sure such specifications could be met. On the other hand, the consumer was desirous of having some kind of specifications on which he might base his purchasing. Hence, the real reason for the adoption of specifications that would make for a common language understandable to both the consumer and the manufacturer.

Another point in the revised specifications that came up for comment was that section concerning moisture regain. Those adopted in 1923 provide for moisture regain in both yarns and fabrics at 7 per cent. It was finally agreed after some discussion that for the present moisture regain for fabrics would be on a basis of 6½ per cent and 7 per cent on yarns.

Another change in the tentative specifications was a provision for determining the average tensile strength, the formula submitted providing that "the corrected strength equals the actual average strength + the actual size above line and specified size below."

Part 2 of the report submitted covering electrical yarns was changed to conform with yarn tolerances, and was finally adopted unanimously.

Part 3, providing for tentative specifications for sewing threads, was referred back to the committee for further consideration, it having developed that the thread committee was a new one, and inasmuch as there was considerable difference of opinion as to what should be embodied in the first report, Secretary Jury moved that this portion of the report be given further consideration and submitted at the next annual meeting.

Textile Exports Gain Value But Not Quantity

The value of America's textile exports in 1923 was 16 per cent greater than 1922, according to announcement by the Bureau of Foreign and Domestic Commerce of the Department of Commerce. This gain in value, however, was not the result of greater shipments, but of the increase of prices, and a gain in imports is also recorded, the report announces.

Textiles represented 24.5 per cent of the total of domestic exports and 26.6 per cent of the total imports of 1923, compared with 22.9 and 27.5 per cent, respectively, in 1922," the report announces. "For statistical purposes, exports and imports are divided into nine principal groups. In point of value, the textile group is the most important, and with the exception of vegetable food products, oil seed, expressed oil and beverages, far exceeds all other groups. It is interesting to note that the trend of textile exports for the past two years has very closely followed that of both textiles and general exports. The fluctuations in United States textile purchases abroad are not so marked as those of general imports.

"The total value of textile exports in 1923 was $1,002,041,446, an increase of 16 per cent over the 1922 figures ($863,679,755). This gain, however, represents in most cases an appreciation in value rather than in quantities exported. For example, 1923 shipments abroad of raw cotton were almost 20 per cent greater in value, but the quantity was 13.65 per cent less than in 1922.

"In 1923, United States foreign sales of piece goods registered a decline of 23,000,000 square yards, but the drop in value amounted to only $6,000,000. The heaviest losses occurred in gray (unbleached) goods, exports of which decreased by 74,000,000 square yards. Of the balance, bleached goods accounted for 22,000,000, printed for 11,000,000, piece dyed for 2,000,000 and yarn or stock-dyed for 12,000,000 square yards.

"The advance in the price of American cloths has been a feature of the piece goods market in 1923. The average price of three gray sheetings and five print cloths, for which the Textile Divnsion has tabulated weekly prices during the past two years increased 17 per cent compared with 1922. This rise in price undoubtedly represents an important factor not only in the losses in American foreign markets but in the invasion of the domestic market by imported piece goods, particularly from the United Kingdom.

"Exports of wearing apparel in 1923 as a whole showed improvement, slight gains over 1922 being registered in cotton, wool, and silk lines, waterproofed clothing, and hats and caps other than straw. American cotton and silk hosiery sales abroad increased but artificial silk hosiery lost ground.

"Other textiles whose export value was greater in 1923 were: Jute manufactures, cordage, except of jute; wool manufactures; linoleum, oilcloth, and coated or waterproofed fabrics.

Imports of textiles exceeded exports by about $5,000,000 in 1923, aggregating $1,007,837,674, a gain of 17.5 per cent over 1922 when $857,330,623 worth of textiles were purchased abroad. Conspicuous gains over 1922 were registered in the 1923 totals for the following groups: Raw wool, $43,794,000; unmanufactured silk, $30,235,000; jute manufactures, $22,447,000; cotton manufactures, $12,084,000; wool manufactures, $11,615,000; and silk manufactures, $6,968,000.

"Especially significant to American manufacturers and exporters are the imports of cotton cloth which increased from $39,073,450 in 1922 to $47,188,033 in 1923, the bulk of which ($37,557,453) came from the United Kingdom. The British invasion into the United States gray goods market, once considered an almost impregnable stronghold of American manufacturers, resulted in imports of this class, mounting from $7,933,985 in 1922 to $18,287,386 in 1923, of which $16,798,941 worth were of British origin. Owing to changes in the unit of quantity for cotton cloths from square yards to pounds for the period September 22, 1922, to March 31, 1923, no exact comparisons of the quantities involved can be made, but a fairly accurate estimate of gray cloth imports is 90,000,000 square yards for 1923, compared with 35,000,000 square yards in 1922. Bleached goods purchased abroad declined from $6,068,135 in 1922 to $3,696,394 in 1923 with an estimated reduction in quantity from 22,000,000 to 14,000,000 square yards. Although there was little change in the total value of colored, printed, dyed, and woven-figured piece goods, the 1922 receipts amounting to $25,071,330 and those for 1923 reaching $25,204,253, the quantities were approximately 35,000,000 and 112,000,000 square yards, respectively. Official statistics of the United Kingdom show exports of piece goods to the United States in 1923 to have aggregated 174,922,200 square yards, valued at $37,575,457 against 95,384,000 square yards, worth $26,750,550 in 1922. Undoubtedly price has been the chief factor in the successful competition of British cloths in the United States. Figures compiled by the Textile Division of the bureau of foreign and domestic commerce show the average weekly price of six shirtings and two printers on the Manchester market to have averaged $0.4476 per pound in 1923 or $0.0835 lower than comparable New York cloths which were quoted at $0.5311 for the past year.

Increasing Demand for American Cotton Goods in Malaya.

A very large business is done throughout Malaya in cotton piece goods of all descriptions. English manufacturers at present hold a partial monopoly in this trade, but are slowly giving way to the ever increasing demand for American products, Vice Consul Richard Ford, Penang, Straits Settlements, reports.

Argentine Trade Is Difficult

Washington, March 9.—American exporters of cotton goods competing for business in Argentina are having "the most difficult period" in the history of the trade, according to advices received from Buenos Aires by the Department of Commerce, Bureau of Foreign and Domestic Commerce.

Trade Commissioner George A. Bardy, writing from Buenos Aires, under recent date, states:

"The chief cause of this trouble is the high landed cost of American goods in Buenos Aires, due partly to the unfavorable dollar exchange and partly to higher factory cost in the United States, as compared with similar costs in Europe. The general situation of the textile market in Argentina is slow, and the European houses are in general selling only for present needs.

"There is no desire to stock up on the part of the importers and wholesalers. Retail textile buying in the country districts is also very slow and there is no sign of any improvement. In the city cotton goods are moving, but retail houses complain that the public is unwilling to pay present prices for the cotton goods and that the buying is slow, awaiting a drop in cotton prices."

Discussing the situation in Chili, Commercial Attache Ralph H. Ackerman advises from Santiago:

"Despite the fact that practically all the large importing houses and the small retailers are complaining of an over-stock of textiles, one of the largest concerns in Chili had a larger sale of textiles during January than any of the preceding months. The principal of this firm for a number of years represented a few American textile mills and one store in Valparaiso and another from the early beginning operated in Santiago. Being convinced that a proper assortment of American textiles was not being sold in Chile in the volume which the market could absorb, the distribution was extended until this concern developed a chain including five cities of the Republic. Sales are strictly on a cash basis and at fixed prices. Job lots of off season fabrics are purchased in New York and satisfactorily distributed.

"During the present season one of the best sellers has been Egyptian designs of crepes and one month's sales were over $100,000, United States currency. Among the items which may be seen in these stores are percales, voiles, poplins, dress goods of all sorts, shirtings, both prints and white, cretonnes, in addition to the usual run of gray flannels, sheetings, both bleached and unbleached, ducks, khakis, drills, both bleached and unbleached, and hollands. The system of one price, cash and no deliveries and by purchasing off season material has enabled this concern to offer these goods at prices much below those in stores which are carrying greater overhead costs, and has proved conslusively that the consuming public will buy American novelty textiles in sufficient quantity to warrant a ready turnover.

SUPERINTENDENTS AND OVERSEERS.

We wish to obtain a complete list of the superintendents and overseers of every cotton mill in the South. Please fill in the enclosed blank and send it to us.

_____ 1923

Name of Mill _____

Town _____

_____ Spinning Spindles _____ Looms

_____ Superintendent

_____ Carder

_____ Spinner

_____ Weaver

_____ Cloth Room

_____ Dyer

_____ Master Mechanic

Recent changes _____

Index To Advertisers

*Indicates advertisement does not appear in this issue.

What World's Cotton Goods Markets Are Doing

England.

Spinners of cotton in the American section have voted an overwhelming majority to organize short time, that is 26¼ hours per week. It appears many of the cotton mills are not in the best financial position and some firms on the Oldham Exchange list were quoted very low last week. One of the cotton members in Parliament has asked the Government to arrange guarantee call loans for cotton mills.—Cable from Trade Commissioner Hugh D. Butler, London, February 29.

Belgium.

Export buying continues to sustain the cloth mills, but local consumers are buying very slowly and only to cover current wants. This attitude is due not so much to the personal unwillingness of the jobbers or retailers to pay current prices as to their well-founded belief that the local public usually abstains from buying in a rising market based on exchange, since its purchasing power does not react as quickly as prices in an industry supported mainly by export trade. Prices have again been raised about 5 per cent.—Acting Commercial Attache Samuel H. Cross, Brussels, February 11.

Italy.

The activity in the cotton industry continues normal, but the prices of cotton are limiting more the margins of profit.—Cable from Commercial Attache H. C. MacLean, Rome, March 1.

Spain.

A factor of much importance in the general commercial situation of Spain and especially of Catalonia, is the depression existing in all branches of the textile industry, which is working on a much reduced basis. Taking the industry as a whole, it is believed to be operating on less than half time, though really accurate information is not available. Some manufacturing interests blame the commercial treaties, which granted lower rates on imported textiles, for this condition. Others consider that the prices of cotton and other textiles has placed them beyond the buying power of the people, considering the present state of prosperity of the country. Whatever the cause, the prosperity of the Barcelona manufacturing region is largely dependent upon the textile industries, and a long continued depression in these lines would be severely felt.—Consul General Ralph J. Totten, Barcelona, January 26.

Hungary.

The condition of the textile market is uncertain. The textile interests vigorously demand a change in the entire import system, and claim that they are unable even to fix prices they do not know on what basis they may make their calculation. Due to the withholding of import permits, the shortage is growing, and the privileged outsiders are selling at prices 50 per cent higher than the quotations of foreign manufacturers. Therefore, the legitimate trade refuses even to quote prices.—Consul General Geo. Horton, Budapest, January 25.

Argentina.

The American textile market in Argentina is passing through what is possibly the most difficult period in its history. The chief cause of this trouble is the high landed cost of American goods in Buenos Aires, due partly to the unfavorable dollar exchange and partly to higher factory cost in the United States, as compared with similar costs in Europe. The general situation of the textile market in Argentina is slow, and the European houses are in general selling only for present needs. There is no desire to stock up on the part of the importers and wholesalers. Retail textile buying in the country districts is also very slow and there is no sign of any immediate improvement. In the city cotton goods are moving, but retail houses complain that the public is unwilling to pay present prices for the cotton goods and that the buying is slow, awaiting a drop in cotton prices.—Trade Commissioner George A. Brady, Buenos Aires, January 21.

Chile.

Despite the fact that practically all the large importing houses and the small retailers are complaining of an overstock of textiles, one of the largest concerns in Chile had a larger sale of textiles during January than any of the preceding months. The principal of this firm for a number of years represented a few American textile mills and from the early beginning operated one store in Valparaiso and another in Santigao. Being convinced that a proper assortment of American textiles was not being sold in Chile in the volume which the market could absorb, the distribution was extended until this concern developed a chain including five cities of the Republic. Sales are strictly on a cash basis and at fixed prices. Job lots of off season fabrics are purchased in New York and satisfactorily distributed. During the present season one of the best sellers has been Egyptian designs of crepes and one month's sales were over $100,000, United States currency. Among the items which may be seen in these stores are percales, voiles, poplins, dress goods of all sorts, shirtings, both prints and white, cretonnes, in addition to the usual run of gray flannels, sheetings, both bleached and unbleached, ducks, khakis, drills, both bleached and unbleached, and hollands. The system of one price, cash and no deliveries and by purchasing off season material has enabled this concern to offer these goods at prices much below those in stores which are carrying greater overhead costs, and has proved conclusively that the consuming public will buy American novelty textiles in sufficient quantity to warrant a ready turnover.—Commercial Attache R. H. Ackerman, Santiago, February 5.

British South Africa.

The outlook for the future sale of textiles is fair. American prices are lower and imports from the United States are heavier. Stocks in most lines appear to be adequate.—Cable from Clerk Wm. E. Vaughan, Johannesburg, March 3.

The Evolution of Bleaching

(Continued from Page 17)

"Whereas certain evil-disposed persons, by sundry devices, stretch linen cloth both in length and breadth and then beat the same, casting thereupon deceitful liquors mingled with chalk and like things whereby the cloth is made finer and thicker to the eye, but the threads are thereby loosened and made weak. If any person shall hereafter use the said deceits, or do any other act with any linen cloth whereby it shall be made worse, the said cloth shall be forfeited."

To the efficacy of the water of Haarlem Lake was attributed the cause of the success of Holland in bleaching. The water percolated into this lake through sand dunes, and was thus filtered. Many extensive bleachworks were erected on its shores, which treated linens from Germany, Belgium, Scotland and Ireland; large quantities came from Silesia, and shiploads from Ireland and Scotland to be bleached. Although linen manufacture declined in Holland, the bleaching flourished until the end of the eighteenth century, when the modern system of bleaching by the agency of chlorine practically stifled it.

The opinion was held that successful bleaching could not be done far away from the sea, but this was probably due to the effectiveness of the sun at the seaside. The Dutch bought up all the pearl ash available for use in their process, and they attached prime importance to the use of Muscovy ash. Wringing was done by means of a machine which turned with a wheel.

In Silesia, in 1618, Horner states that the weavers brought their goods from their mountain villages. The burghers bought them and finished them in their own bleachfields, which lay at a considerable distance outside the towns. These fields belonged to the town, and were given to the burghers in hereditary leases. Later the burghers were only permitted to finish the goods they themselves sold. In 1783 Silesia was noted for its bleach, and all cloth produced had to be bleached at local greens. Each bleaching foreman had to have a certificate of proficiency, which was given after an examination before three competent bleachers. No foreigner was allowed to work on the bleaching greens. Bleachers were only allowed to take as much cloth as they could comfortably and well bleach. Brown linens when delivered were at once examined and steeped, and if linen delivered to the greens turned out bad, the merchant had to be warned within ten days. Regulations were also made as to the size of the vats and the quantities of linen they should contain. Bleachers were to be very careful in the use of lye; they were to use neither salt nor lime, and in bleaching yarn no potash. Cloth was to be milled only once, as otherwise it would lose in breadth; it was also directed that the goods should be carefully watered, and that care should be exercised to see that they did not freeze in winter. If these regulations were followed, it was considered that a good bleach could be obtained in nine or, at the most, ten weeks. If the bleacher delivered goods not full white and faultless, the owner could have them examined by two independent merchants, and the bleacher had to pay the cost of the goods being again bleached. Bleachers were enjoined to emulate the bleaching of Haarlem, and prizes were given to encourage the industry; but despite all the efforts made, the achievements of Holland were never equalled, and the finer kinds of linen were always sent to that country to be bleached.

In Bielefeld the finest of linen was made, finer than Dutch or Irish, and largely exported to the United States, their webs to be bleached, but sometimes farmers bleached their own linen. In 1789 there were 80 bleach-greens in full work in County Antrim, 40 of which were situated within a radius of 10 miles of Belfast, and these latter turned out 170,000 pieces annually. In 1800, these greens were reduced to 17, but each did a greater amount of work. In County Down there were 20 bleach-greens in 1808, bleaching an average of 8,000 pieces. A bleacher expert at certain classes of goods would receive such goods from all parts of the country. The bleachers burnt turf, and the rapid use of this was a serious consideration at the time. In 1806 the average price of a web of linen was 25s, and the bleaching price 10s. Brown goods were offered to the bleachers, and these when bleached were sold to the merchants or factors; the bleacher usually sold his bleached goods, and did not bleach on commission. A linen hall was founded in Dublin to which merchants sent their bleached linens, and this institution proved of great advantage to the trade, especially to the English trade, for it obviated the necessity of buyers traveling into the country. A linen hall then appeared in Belfast.

Parkes points out that Irish bleachers had to stamp their names on the end of every web, and if the goods were not properly bleached the bleacher had to take the goods back, besides paying a fine. At one time people went round collecting damaged Irish linens, for which they paid good prices, in order to receive these fines. At this time the Lancashire manufacturers stiffened finished calicoes to imitate Irish linens, and even stamped them with Irish names. The Irish were as bad, however, for they stamped their linen. Besides bleaching their own, they bleached for other districts. In Austria the trade was considerable. From Russia, in 1800, large quantities of linen cloth were exported, but only a small proportion bleached.

Bleach yards were at one time spread all over Ireland, and small weavers brought thread "Paisley," in order to compete with the Scotch article, and the Scotch sold goods stamped in imitation of the Dutch.

The first bleach-field of which there is a record in Scotland was Fletcher's, at Salton, in East Lothian, about 1730, although one authority states that linen cloth, bleached and unbleached, was exported to Spain in 1590. After 1730, others were started in the neighborhoods of Ormiston, Perth, Glasgow and Aberdeen. In 1728 James Adair, of Belfast, received grants from the Scottish Board of Manufacturers to establish a bleach field in Galloway, and in 1732 R. Holden, another Irishman, introduced a method of bleaching with kelp, and the Scottish Board helped him to establish a bleach field at Pitkerro, near Dundee. The processes employed were copied faithfully from the Dutch. The Scotch, so late as 1752, sent their linens over to Haarlem to be bleached, the goods manufactured one year being sent the following March and returned in the October, and then sent to London to be sold under the denomination of "Scotch Hollands." In 1749 an Irishman, who had learned something of the art of bleaching, settled in the North of Scotland and established a works for the bleaching of Scotch goods, it being evident that the art was practiced in Ireland before Scotland. This individual applied to some of the most eminent Scottish manufacturers, who were so pleased with the prospect of being able to bleach at home that they readily entrusted him with goods to bleach. These, however, were so ineffectually managed that their owners were compelled to send them to Holland to be cleared and finished. The next parcel which these proprietors furnished him with were bleached no better; for, after having kept them in operation the whole of that summer and half of the next, the goods were returned very much injured, and even rendered tender by this process. In the course of a few years, however, this same person became an excellent practical bleacher; all the neighboring manufacturers employed him, and from that period no more goods were sent to Holland.

The Commissioners and Trustees gave £50 annually in 1758 for instructing apprentices in the art of bleaching, and £230 for promoting bleaching by prizes or otherwise. The British Linen Company, incorporated in 1746, assisted bleaching by buying fat and wood ashes from abroad and selling them on credit to proper people. Bleaching was only carried on in the summer months, and to finance weaving and bleaching was difficult, for stocks of cloth were held by the bleacher for a long time. In 1794, at Perth, there were three linen printing works—Ruthven, Tulloch, and Cromwell Park—and four bleach fields, which bleached cloth for the country round, and even English cloth was sent. At Luncarty, 600,000 yards of cloth were bleached annually, two-thirds of which were low priced linens; also diaper and table linen from Dunfermline, Edinburgh and Perth, the remaining third being fine linens and sheetings. Pitcairn Green, near Perth, was then a thriving weaving center, and it was said that it showing signs of rivaling Manchester. Now there is no weaving done there, but bleaching is carried on, Perth being the most important center for linen damask bleaching at the present time. Huntingtower turned out a similar quantity to Luncarty in 1794, and Tul-

loch about half this quantity. Stormont did about 450,000 yards. Sir John Sinclair's Statistical Account of Scotland states that the work girls of Luncarty were always clean and tidy, and as a consequence they married young. Referring to the introduction of linen bleaching from Ireland to Scotland, it is significant that in later years machine bleaching as applied to linen goods was introduced from the same source, although the Irish probably learned their method of treatment from the Lancashire way of treating cotton goods.

In America the development of the industry from early times followed the developments in England, just as the development of the spinning and weaving of cotton goods followed each development in this country. In the United States in the eighteenth century the people used to rely on their own hand made goods and importations from England, until Samuel Slater, called the "Father of the American Cotton Industry," taught them how to spin. He was a skilled mechanic, and therefore forbidden to leave England at this time, but he got away in 1789, and soon a large number of cotton mills were erected in New England, "due to his example and success." The English law prohibiting the export of machinery hindered the development of weaving in the United States, but some machinery did succeed in getting over the Atlantic at this time, as it was taken to pieces, mixed up with other articles, sent in different vessels, and assembled when it arrived; but the development of weaving in the United States was principally due to Lowell, who visited England after he heard of Cartwright's invention of the power loom, and although he could not procure any drawings, he carried away definite ideas of the construction of the machine, and decided on future development in the United States. The first cloth produced on the power loom in the United States could not find a market; it was sold by auction, but the market gradually developed.

Similarly, as regards the finishing of their cloth, the Americans relied on skill obtained from England. In 1789 "the white was bleached on a platform in the sun," and then, Meserve states, "relatively few English people came to Lowell. Those who did arrive were a satisfactory and high grade class of operatives. When the Merrimack Company was formed in 1821 an attempt was made to manufacture calico. It was found impossible, however, to get satisfactory results in bleaching, dyeing and printing, and as this art was practiced extensively in England, it was decided to send to that country and secure experienced workers."—Journal of Textile Institute, Manchester, England.

Argentine Cotton Crop Estimated.

The Argentine Minister of Agriculture continues active in his efforts to develop the raising of cotton in Argentina, and it is expected that the cotton crop this year will attain 40,000 metric tons.

Knit Goods Jobbers Plan Underwear Standardization

A committee to work with the Associated Knit Underwear Manufacturers of America in an effort to establish definite standards for knitted underwear has just been appointed by the Wholesale Association of Knit Goods Buyers, affiliated with the National Wholesale Dry Goods Association of Philadelphia, according to a report just made by George A. Fernley, secretary of the manufacturers' organization.

This action on the part of the wholesale merchants follows their unanimous endorsement at their annual convention in New York recently of the advertising and research work being done by the manufacturers. At their convention the jobbers went on record as favoring the endeavors of the manufacturers to overcome various unfavorable conditions in the knit underwear market. One of the prime factors in this work is the development of standards for the improvement of qualities, the elimination of superfluous types, the elimination of sub-standard grades, and the maintenance of a sound, stable basis of operations. For this purpose the manufacturers have appointed Charles Hamlin as research fellow to work in close co-operation with the U. S. Bureau of Standards at Washington.

Those who constitute the wholesalers' standardization committee are Charles E. Hutchinson, of M. E. Smith & Co., Omaha, Neb., chairman; S. J. Liske, of the Youngstwon Dry Goods Company, Youngstown, O., and W. U. Starkey, of Daniel Miller Company, Baltimore, Md. The committee will meet with the manufacturers' committee at an early date, and later meetings will be held at frequent intervals, it is understood.

Italian Manufacture of Cotton Bed Spreads.

The manufacture of cotton bed spreads in southern Italy is controlled by a corporation owning 13 mills. During 1923, this company produced 275,000 bed spreads, a considerable decline from the 1922 output of 470,000 bed spreads. Ordinarily two kinds of spreads are made, those with a fringe, and those without. They may be white or colored, blue and red being the most popular, but sometimes mixed color schemes are used. Prices at the factory range from $2.73 to $5.46, depending upon the fineness of the thread and the addition of a fringe. Prior to 1922, bedspreads were marketed direct or sold to independent exporters in Naples, but now the corporation has its own selling agents in the United States and South America, its chief markets. Declared exports of bedspreads from Naples to the United States amounted to 56,257 spreads worth $163,525 in 1923, according to Consul Gensul General Homer M. Byington, of the State Department.

Eight Phases of Mill Operation

(Continued from Page 18)

Wide gauge spinning frames allow the use of high spindle speed without the undesirable chafing of the yarn caused by separators. In replacing old spinning, it is usually possible to obtain the same production in the same floor space as formerly by installing fewer new wide gauge spindles in place of the greater number of old narrow gauge spindles.

Filling wind has been introduced in many of the new mills on account of its greater production and less waste. Also in some of the older mills, the warp wind frames have been changed over to filling wind with a considerable increase in production, less handling, less waste and better running work. The difficulties first encountered in obtaining proper spooling devices, especially for the coarser yarns, have been overcome, and the filling wind today is satisfactory for all counts. With filling wind, it is usually possible to take out a few teeth of twist gear.

Character of Drive.

There is no other factor in the mechanics of textile production that has as important an influence on the amount of production as the character of drive.

In anticipating increased production, the natural comparison between the two types of drive favors the individual electric drive over the belt drive.

Operation has shown that the higher cost of the individual motor drive is warranted by the amount of production increase; further, its operation has developed a number of incidental advantages contributing to the total greater economy.

With belt drive, the principal detriment to maximum production is belt slip; which is eliminated with the individual motors.

Individual drive has been so well standardized that it is now accepted as a matter of course for many of the machines in the mill. Improvements and refinements are still being made in control devices and other details.

Air Conditioning.

The natural moisture in both woolen and cotton fiber is driven out by the manufacturing process and must be restored and maintained by artificial means, not only to keep the fiber in good condition, but to prevent loss of weight, which will amount to from 4 to 6 per cent.

A well-equipped air conditioning system will quickly pay its cost in the value of regain alone.

Of almost equal importance are the advantages of better running work, of less liability to shrinkage or rupture, of reduction in waste and of a cleanly washed room atmosphere, free from lint, assuring normal conditions for operatives.

While modern humidifying equipment is governed by automatic control devices, the results should never be taken for granted as permanently assured. Room conditions should be checked up from time to time and the equipment kept in accurate working order.

Lighting.

Tests conducted in manufacturing plants to determine the relation of lighting conditions to efficiency of factory workers have demonstrated with unfailing certainty that poor lighting conditions cause a corresponding falling off in production and quality. In specific tests where the lighting has been increased to a point considered adequate, the results obtained have been remarkable.

Lighting conditions during daylight hours have been improved by modern mill construction, with its large window areas and white paint. Where fine goods are woven, the use of the saw tooth roof construction provides the better lighting required.

Proper illumination for night work is quite as important and requires the right selection and placing of suitable fixtures and lighting units. This will be governed by the individual condition of each mill.

Power.

In no other department of the average industrial establishment is economy of such far-reaching importance as in the power plant.

When it is considered that between 50 and 65 per cent of the cost of power plant operation is in the fuel used, it is evident how important it is to use as many fuel and power-saving devices as may be consistently and economically adopted within the limitations of size and capacity of the plant.

Where fuel is used for purposes other than power plant operation, such as furnishing heat to factories, hot water, process steam, etc., power may be generated as a by-product at a relatively insignificant additional cost.

This has often resulted in an economy of such magnitude that it has paid for the additional equipment in a short time, making the only expense the temporary interest on the investment.

The power plant has been in some cases the keystone that determined the difference between profit and loss.

Arrangement of Departments.

In the design of new mills, the proper arrangement of departments, the balancing of equipment and the routing of material in process of manufacture is easily taken care of.

In finishing plants, it is desirable where possible to place the machines in range resulting in a saving in labor and floor space; also in seconds. This arrangement also gives a more uniform product in less time than the old plan of using separate machines. Automatic systems are available for regulating and controlling the speeds of the machines in the range so as to properly handle the cloth without undue strains.

Fine goods mills using silk as a part of their raw material have found it advantageous to equip a silk handling department. This has resulted not only in economical handling, but also in a surety of having stock immediately available when eeded.

The importance of proper opening

and preliminary cleaning is now being more clearly understood and appreciated. Well-designed opener rooms with ample bins and floor space are a part of the equipment of a well-organized mill.

Each mill should have a modern supply room arranged for the economical handling of material and parts, and for having them always quickly available for use. A proper system includes well-designed bins and shelves protected from theft and easily accessible. A simple but reliable follow-up system should be used in the supply room to prevent undue depletion of stock and maintain a perpetual inventory.

In many of the older mills, originally unfavorable conditions have been and can be improved. The greater flexibility of power application, where individual motor drive is adopted, facilitates the shifting of machinery and rearrangement of departments, making it comparatively simple to secure a more productive layout.

Importance of frequent checks of humidity and the keeping of proper production records cannot be overemphasized. Except where individual motor drive is used, frequent tests should be made to assure that speed of machines is kept up to the proper point.

The influence of harmonious working and living conditions is well recognized and is receiving constantly the attention it deserves.

Southern Exposition in New York

Plans for the holding of a large Southern Exposition in New York City in January of next year are announced in the prospectus issued by those in charge, which has the following to say of the Exposition:

The Exposition will show to the world what the South has done and is accomplishing. The South desires for its products; to attract visitors; gain new citizens, investors, manufacturers, farmers, professional and business men—young men and women, as well as those of middle and mature age, people of character and high standards of industry and living. Thousands from the West and the North will visit the Exposition and find spread before them a panorama of beauty and interest.

This undertaking is a co-operative movement. It is not a profit-making venture. The leading men of the South are giving it their encouragement and support. The plan has been endorsed by practically every trade publication which circulates below the Potomac River. It is estimated that since it was announced in January the Southern Exposition has received about 50,000 columns of publicity. It has been featured in newspapers all over the United States, the Associated Press having sent out the first release on January 5.

Co-operating with the Southern Exposition will be individuals, chambers of commerce, manufacturing and trade associations, agricultural societies, development boards, railroad, mining, timber, land and power companies, industrial bureaus and other agencies. These will aid in conducting a national advertising campaign.

The exhibits will include the products of factories, industries, mines, agriculture and horticulture; the means and equipment for transportation, power, sanitation and education; pictures and specimens of natural resources; and generally will show the progress of development. Special days may be set apart for State societies in the metropolis. Many suggestions for these have been received.

It is obvious that with numerous exhibitors arranging the displays from the various States, the Exposition will be original and interesting.

The show will open January 19, 1925.

William G. Sirrine, the president and treasurer, is a lawyer of Greenville, S. C. He is president of Textile Hall Corporation in that city, and has directed the Southern Textile Expositions, Textile Products Show, Southern Homes Show, Southeastern Pure Food Show, and others.

Col. Joseph Hyde Pratt, of Asheville, N. C., the vice-president, has a successful record as an organizer and executive. He was colonel of the 105th Regiment of Engineers of the 30th Division in France during the World War. He is a consulting engineer, president of Western North Carolina, Inc., and connected with a number of national movements, such as the Southern Appalachian Highway Association, National Drainage Congress, Southern Forestry Congress, Southern Appalachian Power Congress, American Forestry Association and others.

F. Roger Miller, of Macon, Ga., chairman of the advisory board, is business manager of Macon Chamber of Commerce. He was formerly president of the Southern Commercial Secretaries Association, organizer and director of the Southern Aeronautical Congress, Dixie National Tractor Exposition, and the Macon Centennial Celebration.

Col. Holmes B. Springs, of Greenville, S. C., is secretary. He was colonel of infantry in the 30th Division in France during the World War. He is vice-president of the Woodside National Bank, and has just retired as president of the Greenville Chamber of Commerce.

India Buying More Cotton Cloth.

Consul General Alexander W. Weddell, Calcutta, cables that the Bombay raw cotton market is quiet with a downward tendency, the price of Indian cotton having dropped from 618 rupees per 784 pounds on January 26 to 591 rupees on February 26. (The exchange value of the rupee was $0.3031 on January 25 and $0.2993 on February 26.)

Bombay receipts of raw cotton from September 1, 1923, to February 14, 1924, totalled 1,849,000 bales and stocks on hand on the latter date were estimated at 718,000 bales, compared with stocks of 513,000 bales on January 17. January exports of raw cotton were 104,707 tons, an increase of 117 per cent over the December shipments of 48,305 tons.

Stains On Textiles

IN ordinary mill practice, the prevention of stains on textiles is much more difficult than their removal, but at the same time, the removal of stains is by no means an easy task. As a general rule, the most commonly occurring stains are those due to the presence of oils of some kind, which indicate their presence on the finished goods more distinctly than before the fabrics have been dyed. This is especially true of cotton goods, from which, as experience has long shown, mineral oil stains can only be removed with great difficulty, if at all. Stains due to the presence of vegetable oils, if the latter are non-drying, may be removed very satisfactorily from most cotton fabrics by scouring with soap and soda and finally thoroughly rinsing. The presence of oil stains is shown on the finished goods by spots that are slightly lighter in shade than the surrounding portions.

A commonly occurring stain is due to imperfect kier-boiling and washing of cotton piece goods. Cotton goods always contain a certain variable amount of sizing or dressing on the warps for the purpose of facilitating weaving. This dressing always contains besides a starchy substance, some fatty or waxy bodies which serve as softeners. If these latter bodies are not completely removed from the goods by means of a thorough boiling, they act as resists for whatever dyes are subsequently used for coloring. Since the cloth is commonly "roped" down into the kiers in successive layers, there is a tendency for imperfect saturation by the kier liquors, with the result that some parts of the folds or twists of the cloth are not as fully acted on as some other parts, and as a consequence, a sufficient portion of the dressing is likely to remain in the cloth and act as a resist towards the dye, showing with more or less distinctness when the cloth is finished. So far as is known, no practical method exists for overcoming this trouble. The only suggestion to offer is that the kier boss should allow ample time for the alkali to do its work, and this can be done only after considerable experience.

Lime stains are very common, especially on woolens and worsteds, particularly when they are scoured in hard water. This hard water proposition has been discussed times without number, during the past twenty-five years, but the defective results due to hard water seem to be as common as ever. Hard water and soap are incompatible, and it is useless to expect good results when such water is used. The lime of the water combines with the fatty acid of the soap, forming an insoluble fatty-acid soap which adheres with great tenacity to the fibres, and cannot be removed successfully by any subsequent rinsing or scouring process.

When a fabric is contaminated with a deposit of lime soap, it usually shows shaded areas that are quite irregular in outline; sometimes they cover wide areas on the cloth. Most frequently the lime-soap deposit takes on a deeper color than the other portions of the cloth. The only remedy for this kind of trouble is to use soft water, and if a generous supply of this is not available, the ony recourse is for the mill to install a water-softening plant. There are no dyes available that will evenly color such pieces.

Stains on worsteds due to some defect of the carbonizing process are not uncommon, but owing to their nature, are difficult to trace to their source. Generally, it has been found that such stains originate by the fabric coming into contact with the lead lined inner surface of the acid tanks. These "lead stains" are known to affect the actual dyeing by their resistance to the dye, and as a consequence appear lighter than the ground color.

Iron stains appear to be more frequently encountered on cotton goods than on other materials, and it is seldom that anyone can explain how they occur. As a rule, most iron stains are due to contact of the cloth with the sides of the iron kier in which they are boiled. The only remedy is to protect the cloth against such contact by whitewashing the inside of the kier. Iron stains are also due to the presence of iron in the water used. This form of iron is usually combined chemically with organic substances in the water and is to be removed by special treatment.

Stains due to iron are difficult to remove. Such stains generally show themselves before dyeing as brownish patches of greater or lesser intensity, but afterwards they show distinctly as darker patches. Of course, when iron-stained cotton goods come in contact with tannic acid in any form, very dark patches appear, due to the formation of an iron-tannate. Recently the writer's attention was directed to unmistakable iron stains that showed distinctly on some special cotton fabrics. The water used in the mill was known to contain traces of iron, but it was believed not to be sufficient in amount to show with such prominence. Careful examination disclosed that the stains were due to the formation of the above mentioned tannate of iron, but how the tannin got there was a mystery. Later, during the investigation, it was learned that one of the workmen was in the habit of drinking tea with his noon-hour luncheon, and that some of it accidentally was spilled on the cloth. Tea contains tannic acid, sufficient to show distinctly when combined with iron, and the combination of the two caused the stain to appear.

Machinery oil stains are the most

difficult to attack, especially such as are due to drops of oil from moving machinery, either thrown on the goods while in process or by dropping from the floor above as is frequently the case; or, as has been observed in a few instances by dropping from the elevator mechanism while the cribs of goods were in transit from one floor to another.

Machinery oil directly from machines almost always contains besides the oil finely divided metallic particles or graphite. In either case such oil stains are practically hopeless and cannot be removed. Of course, the oil itself may be removed, but the metallic portion works its way into the interstices of the fibres and is held there. No amount of rubbing with solvents does more than to leach out some of the oil, and cause the dirt to work still further into the goods. Such stains will always show up as dark patches.

Mildew stains belong to a class by themselves, owing to the peculiar nature of their cause. The origin of mildew is now well known, but the methods for preventing its development are not thoroughly understood. The reason for this is that the great majority of those who are confronted with mildew problems, knowing that mildew itself is a low order of plant growth, and assuming that almost any harsh chemical treatment will be effective, fail to realize that the damage to the cloth has already been accomplished. The time and place to attack mildew is when the goods are placed in a warehouse before and after dyeing and finishing.

Generally mildew on dyed cotton shows up as lighted color spots or areas, due to the fact that the cotton itself has been attacked and has given up some of its substance to nourish the growing mildew. This subject will be specifically discussed in a subsequent article.—Reprinted by permission from "Dyestuffs," published by the National Aniline & Chemical Co.

How to Keep Factory Workers "Sold" on Job

One of the chief problems confronting the employer of labor, particularly of feminine labor, is that of keeping workers so sold on their tasks that they will not absent themselves from the shop necessarily. When the employer cannot be sure at night that half his employees will not "play sick" and fail to show up the following morning, it is obvious that there is bound to be disorganization of production methods that will prove costly to the manufacturer and consequently to those who buy his merchandise.

It has been found as a result of investigations just completed by Arthur Schwab, management engineer with the Bureau of Factory Practice of the International Association of Garment Manufacturers, that it not infrequently is the rule in plants where girls are employed, that no more than 90 per cent of the workers are ever on the job at one time, and that anywhere from five to fifteen or even twenty per cent of the girls are absent.

Possibly because the average man works because his livelihood and that of his family depends upon it, men are steadier in their attendance to work than women, the association has found. Girls, expecting eventually to marry and leave the factory, have not the interest in advancing themselves that the men have, and, too, girls do not seem to care much whether or not they keep the jobs they have or change about fequently, whereas men generally prefer to stay in one place, learn the business individually, and develop themselves for better jobs with the same organization.

In his report to the association, Mr. Schwab said in part:

"In companies that are classified as 'high grade' in respect to factory management, the absentee record for women workers is from five to seven per cent. If we consider such well-managed factories as standard, absenteeism over seven per cent should be regarded as excessive.

"A number of companies attempt to buy good attendance by offering a money regard as a bonus or premium. This method is a failure. With only two exceptions the companies that have adopted the plan of a money reward for good attendance, have an absentee record of ten per cent or more. Furthermore, our investigation brings out the fact that where the offering of money reward has been successful, its effectiveness diminishes in time as the novelty and interest in earning the reward wears off.

"It is only through persistent follow-up and constantly applied educational programs that absenteeism may be kept to a reasonably low figure. Following are some of the methods employed successfully by members of the International Association of Garment Manufacturers to meet the problem of the worker who absents himself or herself from the job without notice or without sufficient cause:

"Daily accurate record of absentees and accumulative record of every week on a personal efficiency card; immediate home visits to absent employee to ascertain the justifiability of absence and to offer aid when aid is desired; demanding the employee notify the factory by telephone or otherwise when absence is necessary; dismissal of employees who are absent persistently, except, of course, when the reasons given are acceptable to the management; public posting of records of absentees; educational talks to create and maintain interest in good attendance.

"It is often found," said Mr. Schwab in concluding his report, "that married women are absent from work much more frequently and persistently than single girls. Without any attempt to justify or explain such a situation, it is obvious that, since as a class single girls are more effective workers than married women, the percentage of absenteeism in factories may be reduced materially if the employment department will control the proportion of married women employed in the plant.

Southern Mill Stocks

Quoted By
R. S. DICKSON & CO.
Gastonia, N. C.—Greenville, S. C.

	Bid.	Asked.
Acme Spinning Co.	109	112
Arcadia Mills	285	305
American Spinning Co.	290	301
American Yarn & Proc. Co.	104	112
American Yarn & Proc. Co. 8% pfd.	103	---
Anderson Cotton Mills	111	113
Arlington Cotton Mills	114	120
Aragon Cotton Mills (S. C.)	180	---
Arcade Cotton Mills	91	101
Arrow Mills	95	98
Art Cloth Mills	98	100
Augusta Factory	64	---
Belton Cotton Mills	---	81
Belton Cotton Mills 7% pfd.	89	91
Beaumont Mfg. Co.	370	---
Bibb Mfg. Co.	185	---
Brogon Mills	112	114
Clara Mfg. Co.	100	---
Clifton Mfg. Co.	145	147
Cabarrus Cotton Mills	159	---
Cabarrus Cotton Mills 7% pfd.	106	---
Chadwick-Hoskins Co. (Par $25)	17	20
Chadwick-Hoskins Co. 8% pfd.	104	107
Chesnee Mills	150	155
China Grove Cotton Mills	106	109
Chiquola Mfg. Co.	275	285
Chiquola Mfg. Co. 6% pfd.	93	95
Calhoun Mills	141	146
Cannon Mfg. Co. (Par $10)	15¼	15⅝
Clover Mills	95	100
Climax Spinning Co.	159	167
Crescent Spinning Co.	109	110
Columbus Mfg. Co. (Ga.)	147	155
Converse, D. E. Co.	130	135
Cowpens Mills	85	90
Darlington Mfg. Co.	91	95
Dixon Mills	112	120
Drayton Mills	100	---
Dunean Mills	126	128
Dunean Mills 7% pfd.	99	100
Durham Hosiery 7% pfd.	50	55
Durham Hosiery "B"	7	9
Eastern Mfg. Co.	90	95
Eagle Yarn Mills	87	90
Eagle & Phenix (Ga.)	174	---
Efird Mfg. Co.	139	146
Erwin Cotton Mills Co.	144	---
Erwin Cotton Mills Co. 6% pfd.	102	---
Flint Mfg. Co.	134	145
Gaffney Mfg. Co.	95	97
Gibson Mfg. Co.	125	---
Globe Yarn Mills (N. C.)	65	75
Gray Mfg. Co.	115	121
Glenwood Cotton Mills	160	165
Gluck Mills	129	132
Grendel Mills	250	---
Grendel Mills pfd. 7% (Par $50)	48	49½
Graniteville Mfg. Co.	175	---
Hamrick Mills	145	155
Hanes, P. H. Knitting Co.	9	10¼
Hanes, P. H. Knitting Co. 7% pfd.	104	---
Henrietta 7% pfd.	100	102
Hunter Mfg. & Com. Co. 7% pfd.	98	99½
Imperial Yarn Mills	140	148
Inman Mills	160	---
Inman Mills 7% pfd.	101	---
Jennings Cotton Mill	260	276
Judson Mills	171	174
Judson Mills 7% pfd.	102	103
King, Jno. P. Mfg. Co.	168	177
Limestone Mills	145	156
Linford Mills	95	99
Lola Mfg. Co.	90	97
Locke Cotton Mills Co.	165	---
Laurens Cotton Mills	153	160
Majestic Mfg. Co.	171	---
Mansfield Mills	174	---
Marlboro Cotton Mills	74	77
Mills Mill	285	300
Mills Mill 7% pfd	101	---
Monarch Mills (S. C.)	141	145
Mollohon Mfg. Co.	124	128
Mooresville Cotton Mills	107	110
Musgrove Cotton Mills	90	93
Myers Mill	65	71
Myrtle Mills	99	101
National Yarn Mill	135	141
Newberry Cotton Mills	141	144
Norris Cotton Mills Co.	96	100
Orr Cotton Mills	111	114
Orr Cotton Mills 7% pfd.	96	99
Parkdale Mills	104	110
Pacolet Mfg. Co.	220	224
Pacolet Mfg. Co. 7% pfd.	102	---
Piedmont Mfg. Co. (S. C.)	160	165
Perfection Spinning Co.	95	99
Poe, F. W. Mfg. Co.	139	141
Poinsett Mills	110	112
Priscilla Spinning Co.	50	52
Ranlo Mfg. Co.	115	119
Rex Spinning Co.	50	60
Rex Spinning Co. 7% pfd.	59	---
Riverside Mills (Par $12.50)	8	10
Riverside & Dan River	236	251
Riverside & Dan River 6% pfd.	103	---
Rowan Cotton Mills Co.	98	101
Roanoke Mills 1st pfd. 7%	101	---
Roanoke Mills 2d pfd 8%	97	100
Rosemary pfd. 7½%	98	100
Rhyne-Houser Mfg. Co.	85	90
Saxon Mills	110	112
Seminole Cotton Mills Co.	100	105
Sibley Mfg. Co. (Ga.)	77	80
Spartan Mills	170	172
Sterling Spinning Co.	121	125
Stowe Spinning Co.	91	93
Toxaway Mills (Par $25)	36½	38
Union-Buffalo Mills	---	86
Union-Buffalo Mills 1st pfd. 7%	95	96
Union-Buffalo Mills 2d pfd. 5%	57	58
Victor-Monaghan Co.	115	117
Victor-Monaghan Co. pfd. 7%	113	115
Victory Yarn Mills Co.	84	86
Victory 8% pfd.	100	101
Ware Shoals Mfg. Co.	175	195
Watts Mills 1st pfd. 7%	104	106
Watts Mills 2d pfd. 7%	149	151
Winget Yarn Mills Co.	73	76
Wiscassett Mills Co.	190	---
Williamston Mills	195	---
Woodside Cotton Mills	124	126
Woodside Cotton Mills 7% pfd.	91	93
Woodruff Cotton Mills	195	200

Southern Mill Stocks

Quoted By
A. M. LAW & CO., Inc.
Spartanburg, S. C.

	Bid.	Asked.
Abbeville Cotton Mills	110	115
American Spinning Co.	280	290
Anderson Cotton Mills	---	111
Aragon Mills	175	---
Arcade Cotton Mills	---	95
Arcadia Mills	280	285
Arkwright Mills	100	115
Augusta Factory, Ga.	62	---
Avondale Mills, Ala.	700	1000
Banna Mills	50	---
Beaumont Mfg. Co.	415	---
Belton Cotton Mills	75	80
Belton Cotton Mills pfd.	90	92
Bibb Mfg. Co.	180	185
Brandon Mills pfd.	99	---
Brogon Mills	112	114
Calhoun Mills	140	---
Chesnee Mills	150	155
Chiquola Mfg. Co.	280	291
Chiquola Mfg. Co. pfd.	93	95
Clifton Mfg. Co.	144	146
Clinton Cotton Mills	250	---
Columbus Mfg. Co., Ga.	148	151
Cowpens Mills	84	89
D. E. Converse Co.	132	135
Dallas Mfg. Co., Ala.	150	170
Darlington Mfg. Co.	91	94
Drayton Mills	95	---
Dunean Mills	125	127
Dunean Mills pfd.	99	100
Eagle & Phenix Mills, Ga.	175	---
Enterprise Mfg. Co., Ga.	95	---
Gaffney Mfg. Co.	95	98
Gainesville Cotton Mills, Ga.	175	181
Glenwood Mills	165	170
Gluck Mills	128	131
Graniteville Mfg. Co.	175	---
Grenwood Cotton Mills	400	---
Grendel Mills	250	---
Grendel Mills pfd. (par $50)	48	50
Hamrick Mills	145	155
Hartsville Cotton Mills	185	---
Inman Mills	155	---
Inman Mills pfd.	101	---
Jackson Mills	275	---
Judson Mills	172	175
Judson Mills pfd.	101	103
King, John P. Mfg. Co., Ga.	165	175
Laurens Cotton Mills	151	---
Limestone Cotton Mills	150	156
Marion Mfg. Co., N. C.	125	136
Marlboro Mills	74	77
Mills Mill	285	300
Mollohon Mfg. Co.	122	126
Monarch Mills	141	145
Musgrove Cotton Mills	88	92
Newberry Cotton Mills	140	143
Ninety-Six Mills	150	---
Norris Cotton Mills	90	97
Oakland Cotton Mills	124	127
Orr Cotton Mills	110	113
Orr Cotton Mills pfd.	96	99
Pacolet Mfg. Co.	215	225
Pacolet Mfg. Co. pfd.	102	104
Panola Cotton Mills, Class A, pfd. (Par $95)	96	98
Pelham Mills	29	31
Pickens Cotton Mills	141	---
Piedmont Mfg. Co.	160	165
Poe, F. W. Mfg. Co.	137	139
Poinsett Mills	110	112
Riverside Mills (Par $12.50)	9	10
Saxon Mills	111	113
Sibley Mfg. Co., Ga.	77	80
Spartan Mills	168	171
Toxaway Mills (Par $25)	36	37
Union-Buffalo Mills	83	85
Union-Buffalo Mills 1st pfd.	95	96
Union-Buffalo Mills 2d pfd.	57	58
Victor-Monaghan Co.	114	116
Victor-Monaghan Co. pfd.	112	114
Ware Shoals Mfg. Co.	175	195
Watts Mills	90	---
Watts Mills 1st pfd.	103	105
Watts Mills 2d pfd.	148	151
Whitney Mfg. Co.	108	111
Williamston Mills	195	---
Woodruff Cotton Mills	200	---
Woodside Cotton Mills Co.	123	125

New Mercury Boiler May Revolutionize Power Production

(Continued from Page 10)

in steam processes by being carried through a steam super-heater and a feed water beater.

An application of this process on a large scale was built at Schenectady and operated experimentally on many occasions. This equipment was originally designed to give 1,500 K. W. from the mercury turbine but it was never run above 1,050 K. W. Of the 1,050 K. W. so delivered in these tests, 800 constitutes net gain as compared with a 200-pound steam process operating with similar firing conditions. With such a performance of the mercury turbine, and with the steam produced used as in the best power stations, this result is equivalent to about 11,300 B. T. U. from fuel per kilowatt hour. Eighteen thousand B. T. U. per kilowatt hour is considered extremely good in large existing steam stations. This equipment operated with about 12 pounds pressure in the mercury boiler. "By using a pressure of 35 pounds, which seems to be possible," Mr. Emmet says, "the efficiency could be considerably increased."

The present installation is not of sufficient capacity to have much effect on the total cost of power produced by the electric company at the present time. It is large enough, however, to learn much about the results which may be expected when used on a large scale. This initial success indicates that there is no insurmountable obstacle to manufacture sets of a size to replace the present large steam boilers now installed in modern power stations.

The last great step of several years ago in improving the efficiency of manufacturing power was the replacement of the reciprocating engine by steam turbine.

The modern steam turbine under similar conditions is about 40 per cent more efficient than the best reciprocating engines and the attainment of this degree of gain has been the work of 20 years. "It would seem," Mr. Emmet says, "that the introduction of the mercury process would accomplish a much greater gain. And this may be greatly increased because it is believed possible to make mercury turbines much better than those which have been tested and also to cury vapor."
use higher pressures in the mer-

The change from reciprocating engines to steam turbines necessitated complete redesign of the old station. But in applying the mercury process it is only necessary to replace the steam boiler in the large modern plants by a mercury boiler which will give greatly increased output in the same space. In other words, there will be no general redesign of a station to obtain the benefit of the better economy and at the same time materially increase the output from the building. Like all great steps in advance, time will be required to develop and perfect a system before this process can be expected to reflect on the operating costs of the public utilities.

Naturally, the question which will arise in connection with this mercury process is the danger from mercurial poisoning, either to the community or to the attendants. In the first place, as previously stated, all joints are welded, so that it is impossible for mercury to escape except through accident, and arrangements are such that leakage if it should occur will go into the stack where it can do no harm.

Mercury boils and condenses much like water, except that its density is much greater and its boiling temperature much higher. At atmospheric pressure mercury boils at 677 degrees Fahrenheit and water at 212 degrees. Mercury condenses in a 28-inch vacuum at 455 degrees Fahrenheit and water at 100 degrees.

At present mercury sells for about 80 cents a pound. The boiler installed in Hartford contains 30,000 pounds of mercury, and is designed to give from mercury and steam about 4,100 K. W., giving about 7.3 pounds of mercury per K. W. Recent experiments indicate that in future designs 4 pounds per K. W. will be sufficient.

Mr. Emmet, inventor of the mercury vapor process, has had an important part in the designing of electrical apparatus for the General Electric Company and in the development of its uses from the time of the company's formation.

He was responsible for the development of the Curtis turbine and the promotion and direction of the company's steam turbine activities for many years. Mr. Emmet has also been the father of electric ship propulsion and has promoted and very largely designed the very large applications of which have been made in the U. S. Navy and elsewhere.

Cotton Goods

New York.—Actual trading in first hands in the cotton goods markets was light during the week, with prices irregular and easier on some lines. It is believed, however, that the trade will show considerable improvement within the next few weeks. Sales made recently, while mainly of small lots, have run into substantial totals and many stock lots have been cleaned out. Buyers are more inclined to feel that the low in prices has been reached. Should the cotton markets hold firm for the next few weeks, it is believed that the demand for goods will very materially improve.

The demand for print cloths was more general toward the end of the week, although prices on small lots were very low. Print cloths, sheetings and many of the convertibles have held close to the lowest prices of the year and sales have been materially below current curtailed productions. Bleached cottons can be had as low as 10¾ for 4-4, 64x60s staple ginghams, Southern lines, as low as 11 cents, and some of the other staples at relatively low figures. Manufacturers are generally complaining that prices are under cost and merchants handling finished lines say they find it difficult to sell at a profit or to induce traders to lay down forward commitments in normal quantities. Most of the business passing is being done in small lots. In some instances they are frequently repeated so that mills can avoid serious accumulations, but on many lines goods have accumulated in excess of current demands.

Combed yarns were generally quiet. Tussahs were somewhat firmer. A sale of Cantons at 20 cents this week was reported. A sale of some spots of 96x64 Cantons at 20 cents, this week, was reported. This compares with figures that had been heard at two cents a yard less; spots of 35-inch, 96x100 single end held at 25 cents, with reports continuing to be heard, of the lower prices for contract.

Spots of certain make of 34-inch, 72x100, 7.00 yard, sold at 15¾. There are some mills which continue to quote 16¾ and 17 for spot and contract, respectively. For spots of 34-inch, 64x72, 6.40 pongee, 14 is quoted.

Some 40-inch, 96x100, 7.00 yard, combed lawn sold at 18½ cents.

Reports continue to be heard of business in imported broadcloths and in imported shadow stripe warp sateens.

The heavy cotton goods markets showed a continuance of trading as reflected in business the week before. There were not quite as many orders placed this week nor did prices show any improvement from the mill standpoint. A few contracts were placed with deliveries to continue through June. The mills could make the runs in a short time but count on a further addition of commitments. There were sales of single and double filling, both spot and contracts, with quantities not above 10,000 yards. Isolated sales of army duck on a 30 per cent discount basis were reported.

Cotton goods prices in primary markets were quoted as follows:

Print cloths, 28-inch, 64x64s, 6⅝ cents; 64x60s, 6⅜ cents; 38½-inch 64x64s, 9½ cents; brown sheetings, Southern standards, 16; denims, 2.20s, 24½ cents; tickings, 8-ounce, 28 cents; prints, 10¾; staple ginghams(15 cents; dress ginghams, 18½ to 21 cents.

Decline in Japanese Yarn Production.

Warehoused stocks of raw cotton in Japan have increased during January, and the production of cotton yarn declined This decrease in connection with the slump in exports and the increase in warehoused stocks indicates a falling off in the prosperous condition which has characterized the industry since the earthquake. The New Year holidays account for a considerable portion of the decline in production, and also undoubtedly affected exports and domestic consumption, Acting Commercial Attache E. G. Babbitt, Tokio, reports to the Commerce Department.

Cotton Movement From August 1, 1923, to March 7, 1924.

	1924 Bales	1923 Bales
Port receipts	5,759,719	4,944,439
Port stocks	742,962	699,502
Interior receipts	6,674,282	6,613,900
Interior stocks	736,133	835,175
Into sight	9,862,532	9,403,865
Northern spinners' takings	1,442,522	1,809,122
Southern spinners' takings	3,024,125	3,431,960
World's visible supply of American cotton	2,688,505	2,629,677

The Yarn Market

Philadelphia, Pa.—Some improvement was noted in the yarn market last week. Buyers were interested in larger orders that has been the case for several weeks past, which is taken to mean that they believe the markets have reached bottom. There was a steady flow of small orders during the week, the total volume showing an encouraging gain. Buyers who have been operating with very low stocks and coming into the market at the last minute, are having more trouble in getting yarns for prompt shipment, due to the fact that yarn stocks are now very much depleted.

Knitting yarns continued very dull, with a slight decline on some numbers. Prices on the better qualities held firm, however. There was a very good demand during the week for insulating yarns, one order being reported for 500,000 pounds, the numbers covered being 20s, 30s and 40s two-ply.

There was also improved demand for weaving yarns, especially from the towel mills. Inquiry covered large quantities of 20s-2 ply warps. Carpet manufacturers showed more interest.

The demand for mercerized yarns continued very slow, with a further weakening in prices, the latest declines affecting both single and ply yarn. Hosiery manufacturers are showing very little interest in mercerized yarns at present, due to some extent to the recent declines in the price of artificial silk.

Market reports here indicated that spinners' prices have already stiffened following the meeting of the spinners' association in Charlotte last week. Mill prices are still considerably above those quoted by many dealers in this market. It is felt, however, that if the cotton market can hold firm at present levels, that a much better demand for yarns will materialize within a short time.

Yarn prices in this market were published as follows:

Two-Ply Chain Warps.					
2-ply 8s	43½a		2-ply 24s	49½a50	
10s	44 a		2-ply 26s	50 a	
12s to 14s	45 a		2-ply 30s	51 a	
2-ply 16s	45½a		2-ply 40s	60 a	
2-ply 20s	46 a		2-ply 50s	70 a	
Two-Ply Skeins.					
8s	42½a		40s	59½a	
10s to 12s	43 a43½		40s ex	64½a65½	
14s	44½a		50s	70 a	
16s	45 a		60s	78 a	
20s	45½a		Tinged Carpet—		
24s	49½a		3 & 4-ply	38½a39	
26s	50 a		White Carpet—		
30s	51½a		3 & 4-ply	42 a	
Duck Yarns.					
3, 4 and 5-ply—			3, 4 and 5-ply—		
8s	42½a		16s	45 a	
10s	44 a		20s	46 a	
12s	44½a				
Single Chain Warps.					
10s	44 a		24s	49 a	
12s	45 a		26s	49½a	
14s	45½a		30s	50 a	
16s	45½a		40s	62 a	
20s	46 a				
Single Skeins.					
6s to 8s	42 a		20s	46 a	
10s	43 a		24s	48 a	
12s	44 a		26s	49 a	
14s	45 a		30s	50 a	
16s	45½a				
Frame Cones.					
8s	42 a		22s	46 a	
10s	42½a		24s	47 a47½	
12s	43 a		26s	48 a	
14s	44 a		28s	49 a	
16s	44½a		30s	51 a52	
18s	45 a		30s ty'g in	49 a	
20s	45 a45½		40s	58 a	
Combed Peeler Skeins.					
2-ply 10s	61 a		2-ply 50s	80 a	
2-ply 20s	65 a		2-ply 60s	85 a90	
2-ply 30s	70 a		2-ply 70s	98 a	
2-ply 36s	73 a		2-ply 80s	1 12a	
2-ply 40s	75 a				
Combed Peeler Cones.					
10s	55 a56		30s	63 a65	
12s	56 a57		32s	68 a70	
14s	57 a58		34s	70 a72	
16s	58 a59		36s	75 a77	
18s	59 a60		38s	77 a78	
20s	60 a		40s	78 a80	
22s	60 a61		50s	85 a87	
24s	61 a61½		60s	90 a95	
26s	61½a62		70s	1 05a1 10	
28s	62 a63		80s	1 15a1 20	
Carded Peeler Thread Twist Skeins.					
20s, 2-ply	56 a		36s, 2-ply	66 a	
22s, 2-ply	57 a		40s, 2-ply	70 a	
24s, 2-ply	59 a		45s, 2-ply	75 a	
30s, 2-ply	61 a		50s, 2-ply	80 a	
Carded Cones.					
10s	48 a		22s	54 a	
12s	49 a		26s	57 a	
14s	50 a		28s	58 a	
20s	53 a		30s	60 a	

The Week's Cotton Trade

Cotton prices were erratic during the week ending March 7, with final quotations for both spot cotton and future contracts about 1 cent per pound, below the closing of the previous week. The volume of sales of spot cotton in the South continued small with holders indifferent about selling at present price levels. Further slight price concessions were reported from dry goods centers, which factor had a somewhat depressing effect on raw cotton. Reports from English spinners' centers indicated labor troubles in some sections. Exports continue full and are now over 600,000 bales above last season's figures for the corresponding period.

March future contracts on the New York Cotton Exchange closed at 27.85 cents, as compared with 28.88 cents on February 29. No. 5 or middling spot cotton in ten designated spot markets closed at 28.33 cents per pound.

Exports for the week amounted to 100,354 bales, compared with 85,165 bales the previous week and 61,843 bales for the corresponding week in 1923. Exports from August 1 to March 7 amounted to 4,411,001 bales, as compared with 3,783,543 bales for the corresponding period last season. Figures include exports to Canada to January 31.

Certificated stock at New York on March 7 was 146,730 bales, and at New Orleans, 21,440 bales. Total stocks, all kinds, at New York were 156,234 bales, and at New Orleans, 160,370 bales.

Want Department

Textile Plant Location

Best in South. See our proposition. Box 113, Hillsboro, N. C.

Wanted

Position as overseer of spinning. Have had long experience as overseer on coarse and fine numbers, short and long staple cotton. Can guarantee proper results with good level roving. G. H. F., care Southern Textile Bulletin.

Desire Purchase

One combed yarn mill ten to forty thousand spindles, equipped to manufacture from 30's to 70's yarns.

One colored goods mill with eight to fifteen thousand spindles, conveniently located to large stream of water.

Address Box 577, McComb, Miss.

For Sale

Two Knitting Mills of brick construction now in operation with its own railroad siding, under city fire protection and convenient to school, with thirty dwellings for employees; has sufficient land for enlarging mill and necessary dwellings. Capacity of both mills 1,500 dozen per day. Owners desirous of retiring from business. Will sell this property at bargain. Apply to F. C. Ferguson, Box 514, Rocky Mount, N. C.

Mill For Sale.

A good 3,000-spindle mill, with space for 10,000 spindles, and good hydro-electric power. M. B. Pitts, Elberton, Ga.

For Sale.

Liddell hand baling waste press. Excellent condition. Size of bale 27" x 54". $125.00 f. o. b. Charlotte. Address R. S. S., care Southern Textile Bulletin.

For Sale

1—No. 154 Economy Baling Press, very cheap. Perfectly new.

Hampshire Spinning Co.

Clover, S. C.

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The Richards-Hinds Light Running Rolls

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Guaranteed Claims

Cockley Yarn Preventor	Less Change of Roll Settings
Extra Strength of Yarn	Reduced Cost of Spinning
Less Waste	One-third Saved on Leather Covered Rolls
Greater Production	Better Spinning with Improved Product

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The Metallic Drawing Roll Company

Indian Orchard, Mass.

UNIVERSAL WINDING CO.

BOSTON, MASS.

Manufacturers of Textile Winding Machinery

Winding machines for single and ply yarns, cotton, woolen, worsted and silk. Write for circular describing the NEW WIND DOUBLER, also the No. 80 for winding SUPERCONES.

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AMOS M. BOWEN, Treasurer

WM. P. VAUGHAN, Southern Representative

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U. S. Ring Travelers are **uniformly tempered** which insures even-running spinning. They are also correct as to **weight** and **circles.** Quality guaranteed.

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NORFOLK - - VIRGINIA

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The fee for joining our employment bureau for three months is $2.00, which will also cover the cost of carrying a small advertisement for one month.

If the applicant is a subscriber to the Southern Textile Bulletin and his subscription is paid up to the date of his joining the employment bureau the above fee is only $1.00.

During the three months' membership we send the applicant notices of all vacancies in the position which he desires.

We do not guarantee to place every man who joins our employment bureau, but we do give them the best service of any employment bureau connected with the Southern textile industry.

WANT position as overseer weaving. Long experience on wide variety of goods. Can get good production, with small percentage of seconds. Best of references to show character and ability. No. 4127.

WANT position as overseer weave room, large or small. Now employed as overseer and giving satisfaction but wish larger place. Experienced on wide variety of goods, white and colored. Good references. No. 4128.

WANT position as overseer carding or spinning, or assistant superintendent. Am experienced man with long record of successful service. Best of references. Can come on short notice. No. 4129.

WANT position as overseer carding. Competent man who thoroughly understands carding and preparatory processes. Character and habits good, steady work and a hustler for production. No. 4130.

WANT position as overseer weaving, beaming or slashing. Have had 12 years' experience in above departments. At present overseer with 1,000 looms on checks and chambrays and am giving satisfaction. Age 40, married, good references. No. 4131.

WANT position as roller coverer. Experienced, reliable and first-class man in every respect. Best of reference. No. 4147.

WANT position as superintendent or will accept place as overseer carding or spinning. Experienced in some of the largest and best mills in the South and can get results References. No. 4132.

WANT position as overseer carding. Am reliable man of sober habits, good manager of help and thoroughly understand carding. Good references. No. 4133.

WANT position as superintendent of weave mill, or would accept place as overseer weaving in large mill. Can get production at right price and understand quality weaving methods. Best of references. No. 4134.

WANT position as superintendent or will take place as overseer, carding spinning or weaving, prefer weaving. Now employed in good North Carolina mill, but wish to change for better place. Best of references. No. 4135.

WANT position as overseer carding in good sized room. Prefer Georgia or Alabama. Eighteen years as overseer in good mills. Now overseer in large mill but have good reasons for wishing to change Age 48, have family have good textile education and can run the job. No. 4136.

OVERSEER carding, now employed, wishes to make change. My experience and training fit me to handle large job in good mill. Good manager of help, first-class references as to character and ability. No. 4137.

WANT position as superintendent yarn mill of 10,000 to 15,000 spindles. Age 46, married, long practical experience, 12 years as superintendent. Now employed but have good reasons for making change. References. No. 4138.

WANT position as slasher tender or second hand in spinning. Well qualified for either place. Best of references. No. 4139.

WANT position as roller coverer. Am expert in roller covering and can demonstrate my ability in short time. Now employed in good mill. Want to correspond with mill needing man of unusual ability. No. 4140.

WANT position as overseer of carding. Long experience in handling a combination of both rooms and can get excellent results. Good references. No. 4148.

WANT position as electrician with good mill or some other manufacturing plant. Have had 15 years' experience. Can furnish excellent references. No. 4149.

WANT position as superintendent, or would accept place as carder or spinner. Practical man of long experience as both superintendent and overseer. Best of references. No. 4150.

WANT position as overseer carding or spinning, or master mechanic and electrician. Employed at present but have good reasons for making a change. Can come on ten days' notice. First-class references. No. 4151.

WANT position as overseer carding and spinning. Am 44 years old and have had 20 years' experience as overseer and assistant superintendent. Can furnish best of references. No. 4152.

WANT position as overseer plain weaving or overseer cloth room. Have had more than 25 years' experience on practically all kinds of goods. Am qualified to handle either position. Age 46, have family. Best of references. No. 4153.

WANT position as overseer spinning. Have had long experience in the spinning room and have taken a course with the I. C. S. Good references. No. 4154.

WANT position as overseer of slasher department. Age 32, eight years' experience as slasher and beamer. Good references. No. 4154.

WANT position as overseer weaving. Long experience on wide variety of fabrics and am capable man in every respect. Good references from past and present employers. No. 4156.

WANT position as superintendent of tire yarn or fabric plant, or fine combed yarn mill. Now located in East, but have had 6 years' experience in South. Long term of services superintendent and overseer and am reliable man who can get excellent results. Excellent references. No. 4157.

WANT position as overseer cloth room. Long experience on lawns and sheetings and can guarantee satisfaction. Good references. No. 4158.

WANT position as overseer of small card room or second hand in large room. Am also excellent card grinder. Long experience in good mill. A-1 references. No. 4159.

WANT position as superintendent. Have had 18 years as such and am now employed in my 19th year. Can handle yarn or cloth mill and am high class, practical man. No. 4160.

WANT position as overseer carding or spinning, or both. Past experience and training fits me to handle job in efficient manner. Good references. No. 4161.

WANT position as overseer spinning, or overseer weaving. Long experience in good mills in both departments. Reliable, steady man of good habits. Excellent references. No 4162.

WANT position as master mechanic. Now employed. Experienced in both steam and electric plants and can handle work in satisfactory manner. Good references. No. 4163.

WANT position as overseer spinning. experienced for many years on both carded and fine combed yarns. Would like to correspond with mill needing high-class man. Excellent references. No. 4164.

WANT position as overseer weaving. Experienced on many different fabrics and am competent and reliable. No. 4165.

WANT position as superintendent. Fitted by training and experience to handle large mill in satisfactory manner. Good references. No. 4166.

WANT position as superintendent; yarn mill preferred. Now superintendent of good yarn mill and have held job for over two years. Giving entire satisfaction. Thoroughly understand carding and spinning. 15 years as superintendent and overseer. Good references. No. 4167.

WANT position as superintendent of cloth mill. Long experience and can give references from many mill executives to show excellent record of past service. No. 4168.

WANT position as superintendent of yarn or cloth mill. Now employed as night superintendent but wish day job. References to show ability, character and past record. No. 4169.

WANT position as superintendent or will take overseer's place in any department. Thoroughly qualified to handle any room in the mill. Best of references. No. 4170.

WANT position as superintendent or carder and spinner. Will go anywhere. Prefer yarn mill of 5,000 to 30,000 spindles. Can come at once. Best of references. No. 4176.

WANT position as carder or spinner. Ten years' experience in carding, spinning and winding. Now employed, but will change on short notice. Age 37, with family. References from present and past employers. No. 4172.

WANT position as superintendent. Practical man, good pusher, can get quality production on all classes of yarns. Good references. No. 4173.

WANT position as overseer spinning. Practical man of long experience on practically all yarn counts made in South. Good references. No. 4174.

WANT position as overseer spinning. Have had 20 years' experience in spinning, spooling and warping in some of best mills in South, and West, both white and colored work. Age 36, married, sober now employed as overseer. Good references. No. 4175.

WANT position as superintendent or would take overseer of carding and spinning. Many years' experience as superintendent and overseer and am well qualified in every respect. Best of references. No. 4171.

SUPERINTENDENT or carder and spinner desires position. Would take place as night superintendent in large mill. Prefer mill on plain work. Satisfactory references. No. 4177.

WANT position as superintendent of mill or plain weaving or hosiery yarn. Am now 32 years of age and can give good references. Now employed as superintendent. No. 4178.

WANT position as superintendent or assistant superintendent in medium size mill. Would consider weave room in large mill. Best of references. No. 4179.

WANT position as spinner. Age 48. Have had 20 years' experience and can give excellent references. No. 4180.

WANT position as superintendent of finishing in yarn plant. Long experience in large Eastern mill and have excellent record of service. Fine references. No. 4181.

WANT position as carder or spinner, or box comber. Am specialist in combed yarn work and have had a long term of satisfactory service. Excellent references. No. 4182.

WANT position as shipping clerk. Four years' experience and can handle big job Now employed as shipping clerk. Gilt-edged references. No. 4183.

WANT position as carder and spinner. Now employed as such, but wish a larger place. Experienced, practical and reliable man. No. 4184.

WANT position as overseer finishing department, white or colored goods. Have had 16 years' experience in cloth room, 12 years as overseer on white and colored goods, wet and dry finish. Best of references. No. 4185.

WANT position as overseer spinning. Have had 12 years' experience as overseer and can furnish best of references. No. 4186.

WANT position as overseer weaving. Can handle either plain or fancy work both colored and white Now employed. First-class references. No. 4187.

WANT position as superintendent, carder, spinner or carder and spinner. Have acceptably filled overseer's position for long term of years. Best of references. No. 4188.

WANT position as master mechanic and engineer. Experienced and skilled mechanic of long experience. Best of references. No. 4189.

WANT position as overseer spinning. 12 years as overseer and 5 years as overhauler in spinning and twisting. Good references. Address No. 4190.

WANT position as superintendent, or overseer weaving or designer. Have specialized in fancy weaving and designing and can show samples that have proved business getting. Long record of satisfactory service in fine weaving plants. Good references. No. 4192.

WANT position as superintendent of small yarn mill or carder and spinner in larger mill Have had 20 years as overseer. Good references. No. 4191.

WANT position as superintendent or carder and spinner. Now employed but want better job. First-class references. No. 4193.

WANT position as superintendent. Prefer weaving mill. Practical man of long experience on great variety of fabrics. Good references No. 4194.

WANT position as overseer carding anywhere in South. Long experience and also graduate of I. C. S. Good references. No. 4197.

WANT position as overseer spinning, twisting or winding at not less than $40 weekly. Have had 25 years in the mill. 10 years as overseer, have run present room 3 years. Good references. No. 4195.

WANT position as overseer weaving. My experience has been as overseer in a number of large weave rooms and many kinds of goods. Excellent references. No. 4196.

WANT position as overseer of small weave room on plain goods. Am hustler for quality production and good manager of help. Good references. No. 4198.

WANT position as carder or spinner or superintendent. Now employed. Many years as both superintendent and overseer and am competent worker. Good references. No. 4199.

WANT position as carder. Have had 7 years as overseer and can give first-class references. No. 4200.

WANT position as superintendent of yarn or weave mill, or overseer weaving. Long experience in carding, spinning and weaving and winding and can give good references. No. 4201.

WANT position as superintendent of yarn mill. Prefer plant on tire fabrics. Experienced man of good habits and character and can give good references. No. 4202.

WANT position as overseer weaving on any kind of plain work; 12 years as overseer and have always been able to get the goods. Now employed but have good reasons for changing. Good references. No. 4203.

WANT position as spinner. Have held present job for over 6 years and made good record. Can get quality production at right price. Good references No. 4203.

WANT position as carder or carder and spinner. Am hustler for production and quality and know how to keep costs down. No. 4204.

WANT position as superintendent of yarn mill. Have had 12 years' experience. Have finished course in grading and stapling cotton. Know mill business thoroughly. Best of references as to character and ability. No. 4206.

WANT position as carder in small mill or second hand in large mill. At present employed by good mill but desire to change. Good references as to character and ability. No. 4207

WANT position as carder. Thoroughly understand the carding process and have long term of experience in good mill. Best of references. No. 4208.

WANT position as superintendent. Experienced and reliable man who can get results. Experience gained in some of the best mills in the Carolinas. Excellent references. No. 4209.

WANT position as superintendent. Am competent executive and good manager of help, experienced in all departments of mill and man of good character and habits. Best of references. No. 4210.

WANT position as superintendent of medium sized yarn mill or assistant superintendent in large mill Prefer mill in Georgia, Alabama or Missippi. Long experience as overseer spinning. Have held present place as assistant superintendent for many years, making 4s to 40s single and ply cones, tubes, skeins and warps. References. No. 4111.

WANT position as superintendent or overseer carding and spinning. Am 41 years old, have had 20 years' experience as overseer and superintendent of mills in Georgia. Can give good references as to character and ability and can come at once. Good manager of help. No. 4113.

MASTER mechanic and chief engineer of extraordinary ability will consider proposition by March first. Fine machinist and mechanical engineer. Correspondence strictly confidential. No 4114.

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Hopedale Mfg. Co.
Mossberg Pressed Steel Corp.
Steel Heddle Mfg. Co.
LOOM HARNESS—
Atlanta Harness and Reed Mfg. Co.
Garland Mfg. Co.
Palmetto Loom Harness and Reed Works.
Steel Heddle Mfg. Co.
LOOM PICKERS—
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LOOM REEDS—
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Palmetto Loom Harness and Reed Works.
Steel Heddle Mfg. Co.
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——See Architects.
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MILL LIGHTING—
——See Electric Lighting.
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Penick & Ford, Ltd.
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E. F. Houghton & Co.
N. Y. & N. J. Lubricant Co.
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U. S. Oil Co.
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Saco-Lowell Shops.
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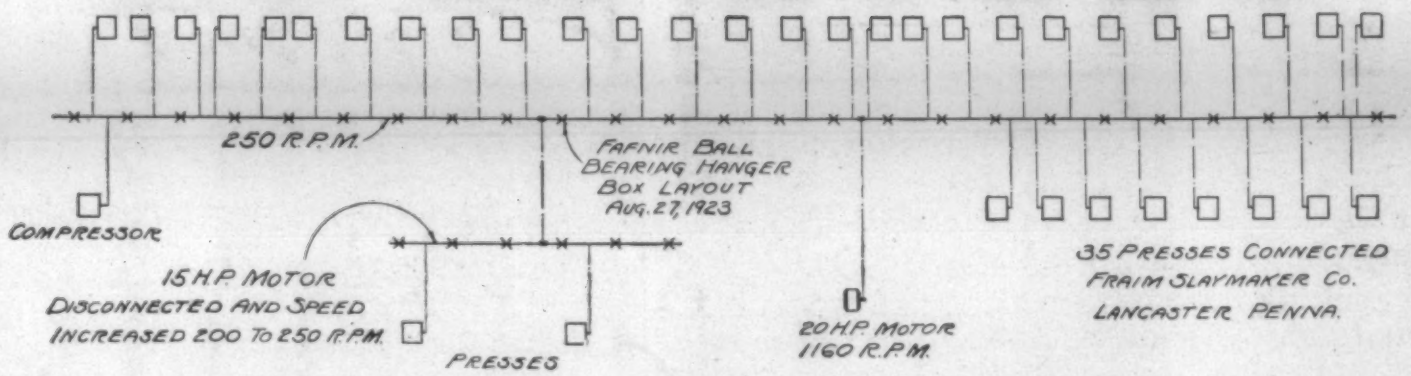

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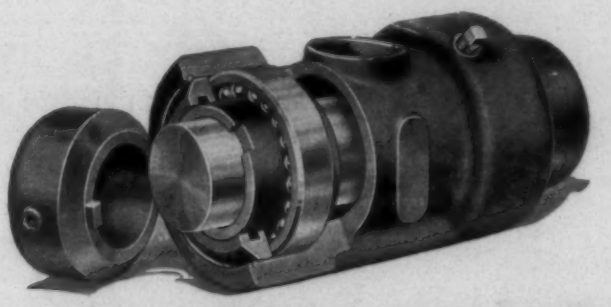
The power tests at the above plant were made by an electrical engineer using a graphic electrical recording machine. We will be glad to send details of this test, or of any of the many others which we have made, to anyone who is interested in efficient power transmission.



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